

Reconciliation & Exception Intelligence

Build RC-698FA2. Every figure below comes from that run of the published artifacts. A document and an evidence package carrying different ids came from different runs.

The problem

A finance team receives payment through a bank lockbox and applies it to open invoices by hand. Most payments match cleanly. The rest are the work: a check settling several invoices with no advice attached, an invoice number written without its prefix, a customer quoting the wrong number, a short payment with an unexplained deduction.

Each one is a small judgment, and there are thousands of them. When the team falls behind, the aged receivables report — the report driving every collections call and every credit decision — quietly stops being true.

The result, in one paragraph

Halbrook's ERP said **4,376 invoices** worth **\$7,184,220** were open at the year end. Material Signal reconciled the bank payments against that population and showed that a significant part of it had already been paid, but had not been posted at invoice level. After reconciliation **3,556 invoices** worth **\$5,763,023** genuinely remained open. Net of \$107,759 of customer credit balances, true accounts receivable was **\$5,655,263**. Separately, the tool isolated **758 receipts** worth **\$1,311,231** that could be posted immediately with no further matching work.

The rest of this page is that sentence, in three parts: what went in, what the tool did, what it found.

1. What went in

Three extracts, each answering a different question.

SOURCE DATA ANALYZED	RECORDS	ANSWERS
ERP AR records	24,831	What did customers owe?
Bank lockbox records	19,160	What did customers pay?
ERP cash-receipt postings	18,384	What has finance already posted?

The AR records are 24,701 positive invoices plus 130 credit notes raised against them. The lockbox holds 19,122 positive payment receipts plus 38 rows reversing checks the bank returned. The cash-receipts journal carries a posting id, a remittance id, a date and an amount; it names no invoice, so it says a receipt was recorded, not what it was recorded against.

Two further files complete the picture: the opening AR open items, so cash settling a prior-period invoice has something to match against, and the period-end AR open-item report, which is the report the reconciliation is testing.

2. What the tool did

The engine matched bank payments to invoices across the AR population in five passes — exact reference, amount tolerance, identifier resolution, grouped payment, and fuzzy — each seeing only what the one before could not resolve.

Then the business test. At 30 June the ERP aging report still showed 4,376 positive invoices open, worth \$7,184,220. The reconciliation tested those apparent open balances against cash that had actually reached the bank, to separate the invoices genuinely still owing from the ones that only looked open because the money had not reached the invoice-level subledger by the period end.

3. What it found

RECONCILIATION RESULT	INVOICES	VALUE
ERP showed open at 30 June	4,376	\$7,184,220
Genuinely still open after reconciliation	3,556	\$5,763,023
Less customer credit balances		(\$107,759)
Net reconciled accounts receivable		\$5,655,263

The difference is not a new investigation population. Those invoices were paid; the payment had not been applied to them. What remains is the legitimate receivable book collections should be working from.

The cash behind it, stage by stage. 812 positive receipts, \$1,438,124, had reached the bank by the year end with no ERP cash-receipt posting against them.

THE UNPOSTED CASH	RECEIPTS	VALUE
Reached the bank, no ERP posting at 30 June	812	\$1,438,124
Less: returned by the bank before the cutoff	(6)	(\$12,536)
Valid cash unapplied at 30 June	806	\$1,425,588
Less: posted in ordinary lag in early July	(42)	(\$99,145)
Still unposted at the end of the window	764	\$1,326,443
Less: would overpay a credited invoice	(6)	(\$15,212)
Directly postable exactly as it stands	758	\$1,311,231

On the day, the aged receivables report — the one collections works from — was overstated by \$1,425,588. The \$1,326,443 below it is what a person still had to key weeks later. They are different numbers, and only the first is a balance-sheet statement.

The difference between the control account and the subledger was in the ERP and discoverable; what was missing was a report that reconciled the two in a form management could act on. Every one of the 758 postable receipts resolves to a single invoice on an exact reference match, so this was never a question of identifying the payments. It was posting throughput.

4. How well the engine performed

These answer a different question from the section above. That one says what happened to the receivable; this one says how far the engine can be trusted to have got it right.

MODEL PERFORMANCE	
Link precision — asserted links that are correct	99.34%
Link recall — true relationships found	97.58%
Receipts linked automatically at high confidence	89.8%
Receipts linked with no variance left to explain	88.1%
Weakest human-review workflow, published	73.4% / 76.9%

Two link rates, because they answer different questions. A high-confidence link is one the engine established without a person; a clean link is one with nothing left to explain. The gap between them is short payments, which are linked confidently and still need someone to find out why the customer deducted. Precision and recall are both published because only one of them flatters the system.

The engine also produces the work: **1,547** proposed links for a person to confirm, **747** records routed for investigation carrying **\$54,969** of variance, and **140** receipts across **64** accounts to resolve before anyone calls a customer. Those are queues, not a share of anything above.

Three capabilities this demonstrates

Layered matching, in order of decreasing certainty. Exact, tolerance, identifier resolution, grouped, then fuzzy. Each pass sees only what the one before it could not resolve, so the cheapest and most certain evidence is spent first and what reaches a person genuinely needs judgment.

What is safe to automate is automated; the rest is a recommendation with its evidence. Each population carries a reason, a next action, and an assurance level measured against the true position. One population here is eligible for straight-through processing — the 758 receipts whose cash can be posted exactly as it stands, measured at 100% precision and 100% recall against the synthetic ground truth. In an engagement that eligibility would sit behind client-approved controls and thresholds. The rest are recommendations: collect, hold, confirm, allocate first, investigate. They come with the evidence and the confidence behind them, and a person decides.

That distinction is deliberate and it is measured, not asserted. Holding an invoice back from collections because its customer has unallocated cash is right 73% of the time and catches 77% of the cases it should — useful as a prompt, not as an instruction, and published as such. Where several sets of invoices sum to the same check — 142 of them here — the ambiguity is shown rather than hidden behind a single suggested answer.

How the cash is accounted for. The lockbox interface posts a daily aggregate journal entry for the total swept: debit the revolver, credit the accounts receivable control account for the receipts identified as settling a trade receivable, and credit unapplied cash for the rest. The second line matters. A known payer is not a known receivable, and \$99,374 of receipts arrived before the year end from customers Halbrook recognizes against no invoice in either register. Crediting receivables for money no customer owes would put the control account wrong in the other direction.

The reconciled receivable of \$5,655,263 is stated net of all valid cash identified as settling a trade receivable - not net of every payment the bank received. The \$99,374 that arrived from known payers against no identifiable receivable is not deducted from it, because there is no receivable for it to settle; it sits in accrued liabilities as customer cash received and unidentified until someone resolves it.

Within that balance, \$5,763,023 is owed on open invoices and \$107,759 is credit balances owed back. Customer credits remain on account and are available to offset other receivables from the same customer, so the balance is presented net at the customer-account level rather than grossed up with a separate liability. Only the invoices are aged: a credit is not debt that is late.

Claims you can check. Every link the engine asserted ships with the true pairings, so precision and recall can be recomputed exactly rather than taken on trust. The receivable ships at balance level - what each invoice was billed, what cash reached it, what credit was raised against it - so opening plus billings less

credits and cash applied ties to the **\$5,655,263** closing balance, of which **7.9%** of what is owed is more than ninety days past due.

Where the work would apply

Cross-system reconciliation, cash application, invoice and purchase order matching, month-end exception review, and any recurring manual matching process that has outgrown a spreadsheet.

See the full project: materialsignal.co/work/reconciliation

Demonstration project using synthetic data designed to simulate a realistic multi-system finance reconciliation problem. No client data appears anywhere in this portfolio.

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