

CONTROL TESTING - PROCESS MINING THE END OF THE SAMPLE

What Process Mining Changes About Control Testing

Process mining removes the inference.

*Control testing has always rested on a quiet compromise:
inspect a handful of items, and infer the rest.*

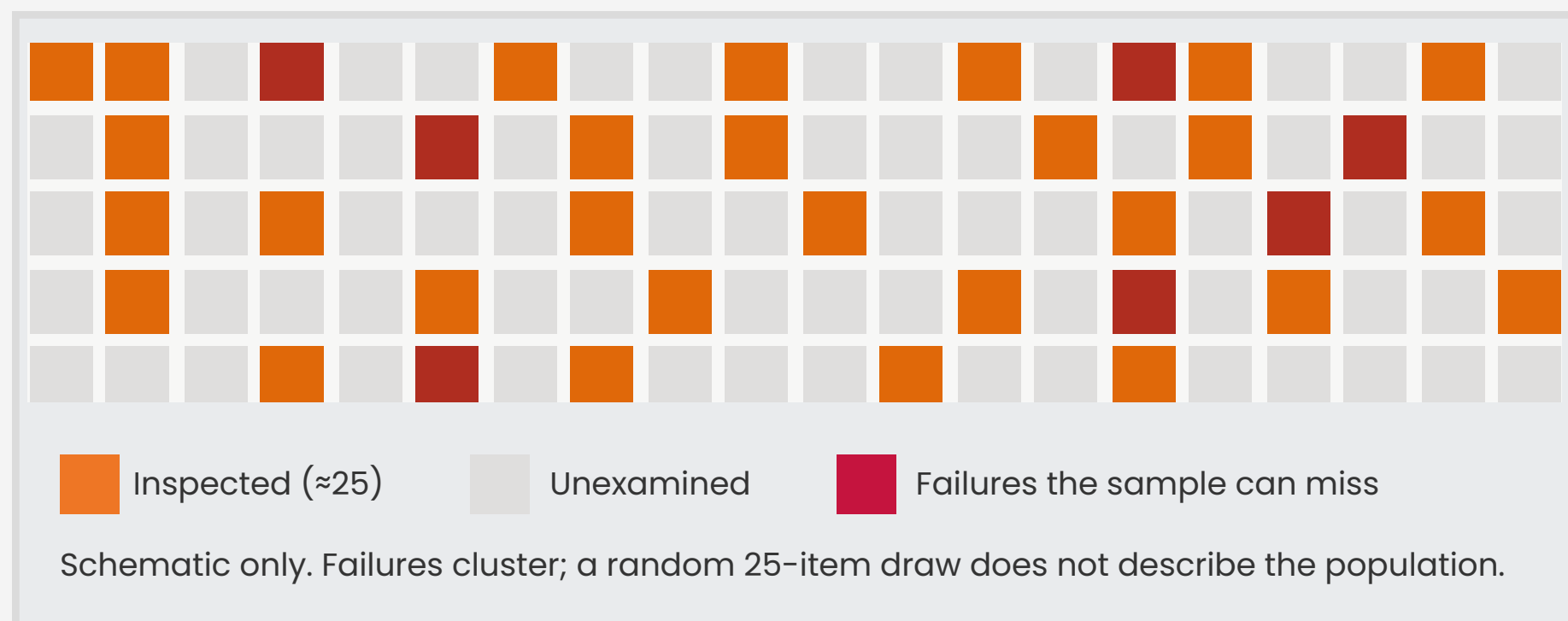


THE INHERITED METHOD

Audit has concluded on populations of hundreds of thousands from a sample of twenty-five.

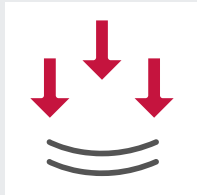
Ask any audit team how it concludes on a control operating across hundreds of thousands of transactions, and the honest answer usually involves a sample of twenty-five.

We select, we inspect, we extrapolate, and we call the result assurance. It is a compromise the profession has lived with for decades — not because anyone truly believed twenty-five items described a population, but because examining the whole population was never practical.



The constraint was never conceptual. It was practical. That constraint has lifted.

Process mining deserves to be separated from the noise around artificial intelligence.



01

More concrete

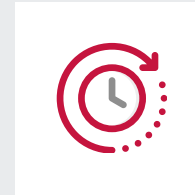
It reconstructs recorded behaviour from systems that already exist. No model of what “should” happen is required to begin seeing what did happen.



02

Better proven

Event-log reconstruction is an established technique. Organisations already generate the raw material — millions of logs — whether anyone looks at them or not.



03

More useful now

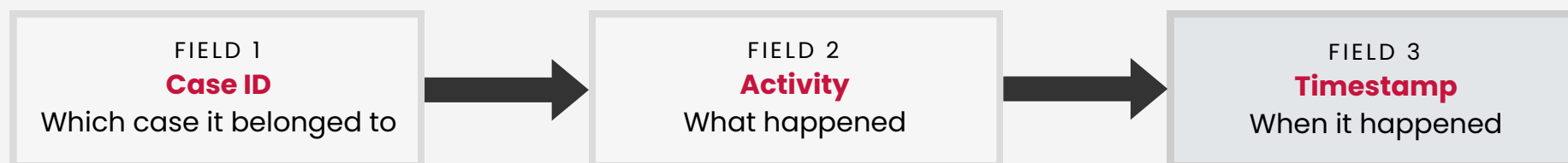
For control testing specifically, it is arguably more useful right now than generative tools: it changes the evidence base, not the narrative around it.

Process mining is what makes examining the whole population practical.

WHAT IT ACTUALLY IS

Every enterprise system already keeps a diary. Process mining reads all of it.

Each time a transaction moves — a purchase order raised, an invoice matched, a payment released — the system records three things. Those records are event logs. Most organisations generate millions of them without ever looking.



NOT THIS

A flowchart of how the process is meant to run, or a sample of how a few cases ran.



THIS

The actual recorded behaviour of all of them — reconstructed from the logs.

FROM DIARY TO PATH

Millions of event-log rows

Grouped by case identifier

Ordered by timestamp → actual path

FROM "THE CONTROL EXISTS" TO "THE CONTROL OPERATED"

The technique changes control testing in two ways that matter.

SHIFT 01 : POPULATION

Inference ends

Instead of selecting twenty-five purchase orders, the auditor sees all four hundred thousand, and precisely which of them departed from the designed control. The question shifts from "did our sample pass" to "how many did not, and which ones."

Sample inspected		25
Population in logs		400K
Departures visible		Exact

SHIFT 02 : SEQUENCE

Path becomes evidence

Process mining observes the sequence and timing of activities — the order in which things actually happened. A control can exist, be well designed, and be documented immaculately, and still be routinely bypassed in live operation.

Designed path

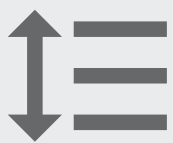


Observed path (bypass)



In a procure-to-pay cycle, patterns fall out of the population automatically.

Familiar to trading, manufacturing, hospitality or real estate. None of these are anomalies an auditor hunts for one at a time. They fall out of the population automatically, because the technique reads what the system did rather than what the file says.



01

Three-way match bypass

Quantified exactly and ranked by value — not discovered by luck.



02

SoD breach in practice

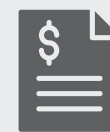
Same user raises the order and releases the payment. A sequence, not a document.



03

Rubber-stamp timing

Maker-checker approvals granted in four seconds.



04

Order after invoice

POs created after the invoice they supposedly authorised.

Each failure exists as behaviour. Sampling would have to be lucky to see it.

The same four failures, seen as the log records them. Each exists as behaviour rather than as a document, which is why a sample of files would have to be lucky to find any of them.

BYPASS : QUANTIFIED

Three-way match skipped on a small percentage of orders

The exception rate is no longer an estimate. It is counted, valued, and ranked. Materiality can be judged against the actual tail, not against the items that happened to be drawn.

SEGREGATION : SEQUENCE

Same user raised the order and released the payment

The breach does not live on a single suspect document. It exists only as a sequence. Policy can be perfect. Practice is what the log records.

User A · raise PO → Match → User A · release pay

TIMING : FOUR SECONDS

Maker-checker approvals granted in four seconds

A timing signature that betrays rubber-stamping. No sample of documents would catch the interval between “submitted” and “approved.” The clock is the control test.

ORDER : INVERTED

PO created after the invoice it authorised

Exposed instantly because the timestamps fall in the wrong order. The file can look complete. The sequence cannot.

Invoice received → PO created → “authorised”

WHERE IT EARN'S ITS KEEP — AND WHERE IT DOES NOT

Process mining is a lens, not an oracle. Treating it as plug-and-play disappoints fastest.

A few honest conditions apply.



01

Only as good as the logs

The technique needs a clean case identifier, a defined activity, and a reliable timestamp. Where systems log poorly, or where a process spans several systems that do not speak to one another, the signal degrades quickly.



02

Volume, not verdicts

Legitimate process variation generates a great deal of noise. Separating a genuine control failure from an acceptable exception is judgement the tool cannot supply.



03

Rewards those who know the designed process cold

Conformance can only be measured against a baseline the auditor has specified correctly. A loose definition of the control produces confident nonsense.



04

What happened, not why

Root cause, intent and materiality remain firmly human questions. The log is silent on motive and on whether the exception mattered.

It relocates the auditor's effort rather than removing it.



AWAY FROM

Selecting and inspecting samples.



TOWARDS

Defining conformance, interpreting exceptions, and explaining what the pattern means.

- Specify the designed path with enough precision that “non-conformance” is a meaningful label.
- Filter legitimate variation from control failure — a human call the tool will not make.
- Rank exceptions by value, frequency and control relevance before fieldwork expands.
- Explain the pattern: what the sequence implies for design, operation and residual risk.

The profession still has to specify the control correctly, separate noise from failure, and decide materiality. What it no longer has to do is pretend that twenty-five items stand in for the population.

WHY IT MATTERS

The usual pitch is efficiency. That undersells it. The significance is evidential.

Faster reviews and less manual effort are real. They are not the point. For internal audit, the significance is the quality of the evidence itself.



SUFFICIENT

Population scale

A profession whose currency is sufficient, reliable and relevant evidence has, for most of its history, settled for evidence that was none of those things at population scale.



RELIABLE

Recorded behaviour

Process mining offers, for the first time and at reasonable cost, control evidence drawn from the entire population's actual behaviour — not from the file that was meant to represent it.



RELEVANT

Path, not paper

Sequence and timing are the facts that sampling of documents systematically cannot see. That is the relevance gain, not a faster walkthrough.

THE CLAIM

That is not a tooling upgrade. It is a change in what audit evidence can be.

The functions that adopt it will find it increasingly hard to justify concluding on a control from twenty-five items ever again.

- Evidence can now be the recorded path of every case, not a sample of documents.
- Exceptions can be counted, valued and sequenced before a single file is opened.
- Design effectiveness and operating effectiveness can be separated with behaviour, not with hope that the sample was representative.
- The remaining judgement — why, how material, what to change — stays human, and is better aimed.

Process mining does not replace the auditor. It removes the excuse that the population was unobservable.

CONCLUSION

Inspect a handful of items, and infer the rest — that compromise is no longer required.

Process mining reconstructs the actual path every transaction took. Sampling confirmed the paperwork. The log shows the behaviour. The functions that treat that as optional will keep defending a sample that the evidence base has already outgrown.

USE IT FOR

Population testing · SoD in practice · timing signatures · inverted sequences · ranked exceptions

DO NOT USE IT AS

An oracle · a substitute for process knowledge · a verdict on intent or materiality



MOVE BEYOND THE SAMPLE

Process mining turns control testing from sample-based inference into population-scale evidence—showing how controls actually operate, not just how they are documented.



FOR A WORKING SESSION
CONTACT US AT

mcagrc@mcagulf.com