

# Transaction Monitoring with Machine Learning

**SafePaaS**<sup>TM</sup>

*Move Forward with Confidence<sup>TM</sup>*



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## Transaction Monitoring



### Controls Catalog

Instant access to the largest catalog of automated ERP controls covering 1,000+ business objects for major processes such as Procure-to-Pay, Order-to-Cash, Hire-to-Retire, Design-to-Ship, and Financial Record-to-Report.



### Big Data Analytics

Our Big Data platform discovers transaction patterns in all types of structured and unstructured enterprise data, and uses this insight to improve bottom line, significantly reduce cash leakage and post-audit recovery costs, improve revenue recognition timing, safeguard integrity of financial statements, and mitigate exposure to fraud.



### Continuous Monitoring

Continuously monitor targeted transactions and events by invoking approvals and notifications when key risk fields are modified. Examples include requiring approvals and reasons for changes to customer limits, and preventing posting of GL Entries into a closed period without approval from the Controller.

## Challenges

Organizations are seeking new ways to transform their rapidly growing data into insight that mitigates risks and unlocks new opportunities.

However, using the traditional reporting tools to look for unusual patterns in large data sets is like finding a needle in haystack.

***The problem is not the resources,  
the personnel, or the data.***

### Too Much Data, Not Enough Analytics!

It's that many organizations simply don't have the advanced analytics required to arrange the data, identify suspicious patterns and weaknesses; at least not fast enough. There's too much data, and not enough analytics!

### Business Threats in the Digital Universe

We are rapidly moving into a digital universe where an increasing number of people are connected to enterprise applications online (cloud-computing), and "things" (smart devices) connected to the internet are unleashing new waves of opportunities.

However, some of the same advances in technology also present the biggest business threats challenging management to reexamine internal controls, information security, fraud protection, and data privacy. Management is suffering from "Audit Fatigue" as regulators around the world impose stringent compliance requirements to ensure transparency and protect stakeholders.

## Goals



## Optimized Process

Hidden bottlenecks, repetitions, and loopbacks in business processes can be tracked, exposed, analyzed, which leads to increased efficiency. Exposing these problematic business activities within the processes also allows for a more effective business process optimization, reduces costs, and improves the bottom line.

## Actionable Insight

Gain actionable insight into your business processes for a timely response to events based on the risk tolerance and treatment guidelines established by management and mandated by regulators. You can continuously monitor business transactions within your enterprise applications

## Best Practices

Adopt industry specific best practices that address the unique needs of your organization. Whether it's streamlining operations, improving the customer experience or identifying new opportunities and markets – you can gain the capabilities you need to drive better outcomes

## What are the 3 Pillars of Modern Transaction Monitoring?

Transaction monitoring has always been the cornerstone of the audit process. It has been a way to infer to some level of probability that a control is effective. The controls of greatest significance for the longest time were the accounts with their own magical double entry controls. Confirming the validity of balances, allowed an auditor to express whether they represent a true and fair view of the financial affairs of the company. This in turn allows an investor to judge the amounts, timing and certainty of future cash flows. It coincidentally has some capability to find fraud. Now we all realize that by the time an issue is reflected in the books of accounts any issue is by definition historical with little chance to correct. We have controls in place within process that are far upstream from the accounts. We also all realize that we have obligations to constituencies beyond investors: employees, customers, vendors and that controls must be in place to protect their interests. Of course, we now have legislation that enforces these obligations, not least of which is GDPR. We also realize that damage can be done to a company's reputation even if the internal controls over financial reporting are effective. For all these reasons transactions need to be monitored to confirm that internal controls, financial, information security and reputation are well designed to remain effective.

## Historical Perspective

To see where modern transaction monitoring is going and to not leave valuable methodologies behind, it is interesting to see its history and project into the future. Our first piece of predictive analytics.

## Sampling

Within the Auditor's toolkit has always been sampling, as a way to predict with a known level of probability whether the hypothesis that a control is effective can be asserted. Verifying every transaction by human power is an expense rarely justifiable to shareholders. Even sampling has had some improvements with the ability to coordinate sample sizing with control frequency and coordinate samples with audit procedures, records request and engagement letters. In this way samples can support the evaluation of many controls in the overall audit plan. With the early focus on the accounts as being the touchstone of internal controls, the hypothesis being tested was that every balance could be supported by underlying transactions and that all transactions get processed. As the audit universe has expanded, hypotheses being tested have expanded: all authorizations have been approved, all expense claims are legitimate, all employees have passed background checks, all activity on the network is legitimate.



## Continuous Controls Monitoring

With the need to increase the reliability of controls, coupled with the need to make the control verification methodologies much more efficient, transaction monitoring moved into the realm of rules being applied and every transaction being evaluated. If we take the example of all expense reports being legitimate, we may have rules that report numerous transactions just under authorization limit or multiple employees with expenses to the same vendor on the same day. Being able to report these allows us to move from a sample based approach to a substantive approach and therefore have a much higher degree of confidence in the assertion. This increase has only been viable because of the ability to deploy specialist tools for continuous controls monitoring, but they can only be as good as the rules that they evaluate

## Machine Learning

### Expressing Rules in Neutral Net and Structured Queries.

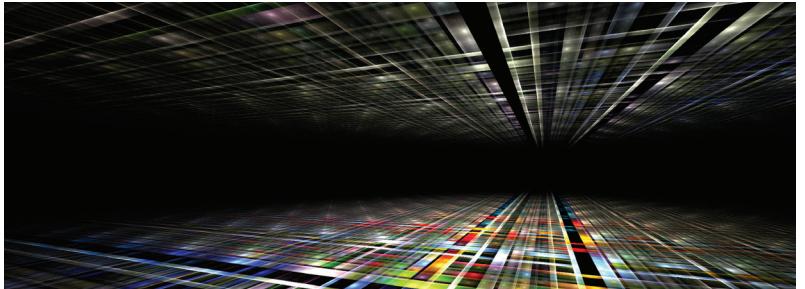
We are all very familiar with a rule as being expressed in a structured query language. For example, if you are looking at general ledger transactions, transactions that release reserves very close to a reporting date might be subject to harsher review for their ability to arbitrarily move a profit number. We can envisage a very simple select statement that might locate those transactions. Similarly, if we are seeing large outbound data volumes from the network, we should be suspicious of the activity and we can see how we might select those from a log. These can also be represented as relationships between attributes in a neural network. The relationships between different attributes may be strong with relationship to a particular outcome. In this case, the outcome is that a transaction is worthy of investigation. We can use our assessment of current transactions as to whether they are worthy of investigation, to strengthen and weaken the relationships. For example, a release of reserves within three days of reporting may be flagged strengthening the relationship, and another release of reserves within 5 days may not be flagged weakening the relationship. Of course, this requires considerable transformation and manipulation from the originating system



# Where is Transaction Monitoring Going?

## Audit as a Service and Mining for Audit Roles

Anomalous transactions are by definition rare. The rate of learning is very dependent on having training data. SaaS companies have access to the precious commodity of fraudulent transactions across their tenants. This means members of the service share the spoils of the service in terms of the refinement of the rules. It also means that the service provider has to be able to guarantee privacy in the use of the learning data. Extraction and Anonymization capabilities must be transparent, so that all parties can understand this risk.



## Audit Optimization

Given that manual audit will continue to be a necessity we need to develop an audit program that will focus scarce audit resources on where they can provide most value to the organization. Objective Function to minimize residual risk, maximize reliability, maximize confidence in the assertion and minimize cost, subject to the constraints of limited people and budgets. Audit Procedures confirm a set of controls that if they prove to be effective, reduce the residual risk in a number of risks identified in the risk assessment phase of an audit program. We also know the time and costs associated to their execution. This allows us to ranks them according to their "risk removed". We can also modify the time and cost for sample size in the control and increase or decrease the confidence in the result. In this way, we can optimize for both "Risk removed" and "Confidence Gained" subject to cost and resource constraints.

## Conclusion

A transaction monitoring solution is vital to protect the validity of financial reporting, assets of the enterprise, Information security and reputation of any organization.

Transaction monitoring is necessary to confirm internal controls are designed well and working effectively. Having adequate internal controls is mandated under many regulations that now include GDPR. A transaction monitoring solution should include manual audit, continuous transaction monitoring machine learning and audit optimization. Specialist providers in the cloud have an advantage in speed of learning through getting training data from many tenants.

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