



Citi® Payment Outlier Detection

Frequently Asked Questions

What is Citi® Payment Outlier Detection?

Citi/Citi Handlowy has designed a sophisticated analytics tool that uses statistical techniques and machine learning algorithms to compare a Client's current payments against their recent payments history to help identify transactions that are materially different when compared to past trends. Then, a company's designated payment reviewer receives an alert when the tool identifies an outlier. The designated reviewer can review and either approve or reject these "outliers" via CitiDirect BE®.

The self-training system learns continuously and automatically adjusts its view on payment behavior as new transaction data is processed. As Citi Payment Outlier Detection processes more payments, its accuracy improves. For treasurers, this tool can be a vital asset for all payment types; as the landscape progressively shifts towards instant payments, Citi Payment Outlier Detection helps fill a critical void in the detection of outlier payments.

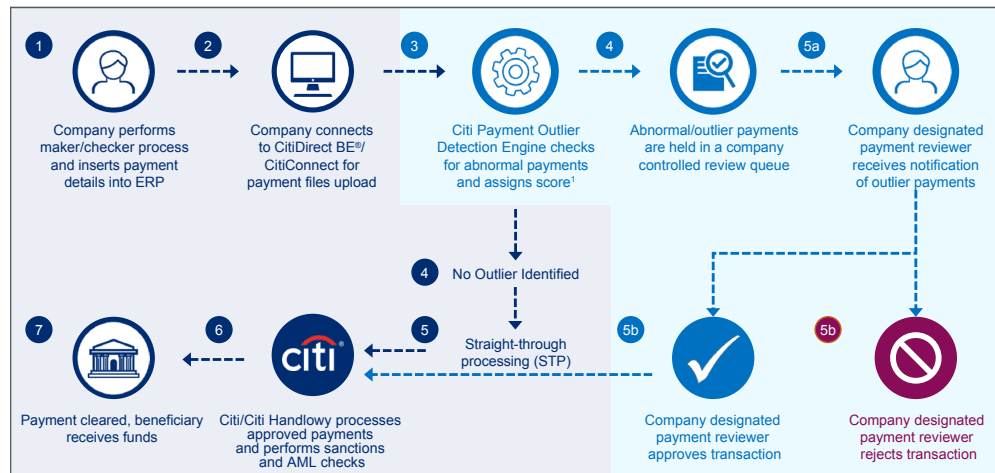
What value does Citi Payment Outlier Detection bring to Corporates?

In today's rapidly evolving and highly complex digital payments landscape, our clients have told us that they face numerous challenges around Accounts Payables security and controls:

- Increasing payment volumes may invite more incorrect payments
- Irrevocability in the age of instant payments, whereby it can be difficult, cumbersome and costly to stop incorrect payments
- As invoice volumes go up, manual processes involved have the potential to introduce human errors

This means the potential cost of even a relatively minor incident of error can be significant for an organization.

How does Citi Payment Outlier Detection work?



¹ Outlier engine assigns a score to each transaction based on degree of deviation vs. past transactions. If the score exceeds the threshold set by the client the engine will flag this transaction as an outlier and place it in a review queue.

1. Company's maker/checker process performed as per existing Accounts Payables process.
2. Company submits payment(s) via CitiConnect® or CitiDirect BE.
3. Citi Payment Outlier Detection reviews and identifies payments that are outside the norm of historic payment behavior.
4. The engine attributes an outlier score for each transaction analyzed. This score refers to the degree of nonconformity of a given transaction from its past trends. The higher the score, the higher the deviation. The company sets the outlier threshold score; Citi Payment Outlier Detection holds any payment above this score in the review queue. There are two options:
 - 4 (dark blue). No Outlier Identified:** score was below the company's set outlier score, therefore payment goes into straight-through processing.
 - 4 (light blue). Outlier Identified:** score was above the company's set outlier score, therefore payment is held in the review queue.
5. The company reviewer (designated by the company) receives notifications via email if any outlier transactions are in the review queue. Your company sets how long the review queue holds the outlier payments. If the outlier is not actioned by the company reviewer within the time-frame set by your company, the outlier payment in question will be processed. The notification prompts the reviewer to log into CitiDirect BE, to review outlier transactions. Upon reviewing, if the reviewer determines that the transaction was unintended (i.e., errors) or was unauthorized, the payment may be cancelled or rejected. Citi/Citi Handlowy does not process the rejected transactions.
 - 5b (light blue). Outlier Identified and Payment Approved:** the reviewer approves the detected outlier for normal payment processing.
 - 5b (maroon). Outlier Identified and Payment rejected:** same as above, except the reviewer rejects the detected outlier and it is not processed.
6. Approved payments go through Citi/Citi Handlowy payment processing platform.
7. Payment clears and beneficiary receives funds.

What are some of the key features and benefits?

Outlier Detection and Explanation	The outlier detection engine flags outliers and sends the details to the company's chosen payment reviewer. The message also contains the main reasons why that specific payment was identified as an outlier.
Offline and Online Mode	<p>Offline mode means the outlier engine flags unusual payments but it does not stop the processing of that payment.</p> <p>Online mode means the outlier engine flags the unusual payment and stops it from being processed. The payment outlier moves into a review queue. The company's designated payment reviewer can then choose to approve or reject the payment. If approved, Citi/Citi Handlowy processes the payment. If rejected, Citi/Citi Handlowy does not process the payment.</p> <p>The offline mode enables companies to try out the service for some time before turning the tool online to help identify outlier transactions and have them held in a queue for further company review.</p>
Machine Learning	The system trains itself to recognize anomalous behavior by comparing current payment activities to past payment activities. The system is also self-learning. It continues to train itself to recognize anomalous behavior by incorporating the latest activity.
Robust Predictability & Explanations	Machine learning approach combines sophisticated algorithms in an effort to produce improved results.
Payment Field Tracker	The system uses relevant fields in a payment transaction for training itself and fine-tuning the underlying algorithms.
Single Sign On	CitiDirect BE will display outlier alerts and details.
Time-bound Hold	The payments review queue holds outlier transactions for a specific time period, or payment cut off time defined by each company, to help ensure balance between security and expediency of payments. If the outlier is not actioned by the company reviewer within the time-frame set by your company, the outlier payment in question will be processed. This feature is applicable in online mode only.
Multi-channel availability	This solution can support payments initiated through CitiDirect BE and CitiConnect.
Unique Data Profiles	Each company would have a unique data profile, which the outlier engine uses when tracking payments. The engine generates a unique data profile based on a company's historic payment data, usually ranging six months. This profile helps to capture the unique payment patterns of each company, which helps increase the detection accuracy and decrease the false positive rates.

What specific elements are part of the machine learning aspects of the solution?

First, Citi Payment Outlier Detection uses machine learning models to create profiles of client behavior by analyzing six months of historical data. Then, Citi Payment Outlier Detection is able to create a unique profile for the company. This unique profile will enable the system to help identify if a new payment is an outlier; outliers are flagged if the payment is above the outlier threshold score that a client determines. Finally, Citi Payment Outlier Detection further trains itself by using various modeling techniques and analyzing multiple combinations from the payment fields in every payment that passes through the engine.

How is machine learning more effective as compared to rule-based systems?

The machine learning models of Citi Payment Outlier Detection provides compelling results as compared to traditional rules-based conditions that can be quite rigid and inflexible in today's payments environment. Citi Payment Outlier Detection deploys a sophisticated combination of multiple analytics techniques to refine the way in which unusual transactions are identified whilst helping to reduce false positives as compared to more traditional rules based systems.

What are some variables that the outlier detection engine uses in its analysis?

Some (but not all) examples include transaction time, transaction value and destination account. The variables are always evolving, as Citi/Citi Handlowy seeks to continue to enhance the underlying engine capabilities.

How is the outlier score calculated? What are the parameters that contribute to transaction scoring?

Citi Payment Outlier Detection works on the basis of risk scoring to identify transactions that display the most important combination of risk factors, including transaction size, destination, payee, time of day/week/month etc. It uses machine learning algorithms to deploy a sophisticated combination of statistical and heuristic modelling techniques for pattern building and transaction scoring. The final score is calculated based on a combination of parameters and the outlier threshold configured by clients.

Can a client decide which parameters go into score calculation and/or assign custom weighting to the parameters?

The scoring engine assigns a score to individual payments by evaluating the unique characteristics associated with it. All payment fields are analysed, including but not limited to:

- Origin and Payee Account Number
- Payment Amount
- Date/time of Payment
- Payee Routing Number
- Maker of Payment
- Payee Country Code/Currency

Parameters cannot be customized for the purposes of scoring.

Will adding new beneficiary cause the tool to flag transaction as an outlier (e.g. payroll payments)? Can legitimate beneficiaries be white-listed?

All transactions are scored based on a combination of pre-defined parameters and the threshold configured by clients. A transaction to a new beneficiary is not necessarily going to be identified as an outlier. There are multiple factors that contribute to the transaction scoring and new beneficiary is just one of them. There is no functionality to white list beneficiaries.

Does the tool pickup duplicate transactions?

The tool does not identify duplicate payments as outliers.

Is it possible to utilize more than 6 months of historic data when creating profile (to account for seasonality)?

Currently, the system uses 6 months of historical transaction data to create the initial user profile. Analysis suggests that this strikes the right balance between the extent of data that is needed to maintain a reasonable scoring accuracy and the amount of data available for most of our clients.

How often is the machine learning model in CPOD updated?

The use of advanced statistical machine learning algorithms enables the system to automatically evolve and improve in response to every user action.

If a one-time exception higher value payment, picked up as an outlier is approved, would this preclude higher value payments to the same beneficiary from being flagged in the future?

Outlier detection is dependent on patterns and trends. A once-off higher value is not what it takes for the Citi Payment Outlier Detection engine to learn, so it might continue to flag such transactions until they become a trend.

If a payment was approved on CPOD, is it possible to revert that and change the status later?

Once action has been taken on an outlier to approve it, it will be processed per usual processing timelines. It is, however, possible to retrospectively amend the feedback by using the 'Approve Feedback' or 'Reject Feedback' options for selected payments.

Is the Citi Payment Outlier Detection tool intended to detect fraud activities?

No, it is not intended to be a tool for fraud detection or control. The purpose of this tool is to help identify payments that significantly deviate from the past payment transactions. The tool can flag unusual transactions (which could be authorized, unauthorized or erroneous) that are statistically different from past payment behavior.

Does Citi/Citi Handlowy cover the costs for any payments that are processed even if they are not identified by the tool as outliers?

No. Citi Payment Outlier Detection is a service provided to help identify outlier payments. Your company is still responsible for any funds lost due to unauthorized payments.

Where is the solution currently available?

The product is currently available across multiple markets globally. Please discuss full product availability with your Citi Relationship Manager.

What payment types does Citi Payment Outlier Detection support?

All payment types supported by CitiDirect BE in the applicable branch country (i.e., ACH, Funds Transfer, Wires, WorldLink®, CBFT, etc.). SWIFT based payments are currently out of scope.

For future value-dated transactions, does Citi Payment Outlier Detection screening/detection start on the value date or on file submission date?

Upon approval and release on CitiDirect BE, payments are sent to the respective Citi/Citi Handlowy product processor(s) for release on the requested value date. CPOD screening occurs at the time of releasing payments from CitiDirect BE to our back-end product processor, hence any outliers will be detected ahead of the payment date for future value transactions.

Are foreign language characters screened on Citi Payment Outlier Detection?

No, CPOD does not currently make the use of non-English characters for transaction scoring.

Are there any specific requirements for CitiDirect BE definitions that can be monitored by Citi Payment Outlier Detection?

Citi Payment Outlier Detection supports payments originated from CitiDirect BE and CitiConnect for Files/SWIFT that flow through CitiDirect BE. The tool does not support payments initiated via SWIFT. For client definitions with no users, clients can either add users or create a linkage to other client definitions that have users set up.

How long does it take to implement/set-up?

Implementation timelines vary depending on the project scope with reference to complexity and geographical reach of the mandate. A typical implementation can take up to four weeks depending on interdependencies between specific deliverables.

Is it possible to have different user roles on CPOD e.g., one profile for reports and other for review and approval?

Yes, it is possible to segregate access for payment review vs. reporting through access profile configuration on CitiDirect BE.

Is CPOD supported via CitiDirect BE Mobile?

Clients can choose to receive alerts regarding pending payments on their mobile device(s), however, payment review and release/reject can currently only be performed on the CitiDirect BE desktop version.