



# Real-Time, Cross-Channel Fraud Prevention for Processors, Issuers, Acquirers and Merchants

*As they confront ever-increasing fraud schemes, financial institutions should consider defending themselves with Smart-Agent technology.*

The economy relies on secure transactions and effective security to maintain a safe and efficient business environment. The question companies are asking is: "How do we efficiently eliminate fraud?"

There is a huge business need for inexpensive, adaptable, real-time, cross-channel fraud detection and prevention solutions. However, most existing solutions are built on antiquated technologies such as Business Rules, Neural Networks, Data Mining and statistics.

Data Mining technology creates a decision tree from historical data. This method applies the same logic to all entities, although in reality each entity may have a unique activity pattern. Decision trees are stagnant while fraud schemes continue to evolve. These outdated decision trees fail to detect new types of fraud.

Another widely used technology is Business Rules. This technology requires experts to divide the population considered into categories, and then write rules for identifying fraud within each category. This approach has two significant limitations. First, there may be many different types of individual behavior within each category. Broadly applying category-specific rules in these cases will result in poor detection and high false positive rates. Second, rules are "hard-wired" into the system. As a result, they cannot adapt to ever-changing fraud schemes or data shifts.

Neural Network technology learns from historical data for future data classification. As with Data Mining, Neural Networks cannot detect any new fraud schemes (that arise daily), and apply the same logic to all entities even though each entity has a unique activity pattern.

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# The Benefits of Smart-Agent Technology

Traditional computer programming is purely algorithmic. An algorithm enables the computer to repeat long suites of logical operations tirelessly and accurately, as long as the algorithm is correct. As a result, it is unable to take initiative, fix errors or deviate from a fixed line of code.

Consider the following example: while a computer can be programmed to detect viruses, the best anti-virus software still relies on a team of engineers, a large amount of manual labor and increasing resources. Due to the rigid format of algorithmic programming, computers are simply not able to learn and adapt to new threats in real-time. The same problem arises in fraud prevention, anti-money laundering, credit risk prevention, device identification and data breach detection.



Contrary to previous technologies, Smart-Agent technology learns and tracks the specific behaviors of each entity (cardholder, merchant, device, etc.). As it learns from each entity's individual activities, the Smart-Agent updates relevant profiles and makes effective changes at runtime.

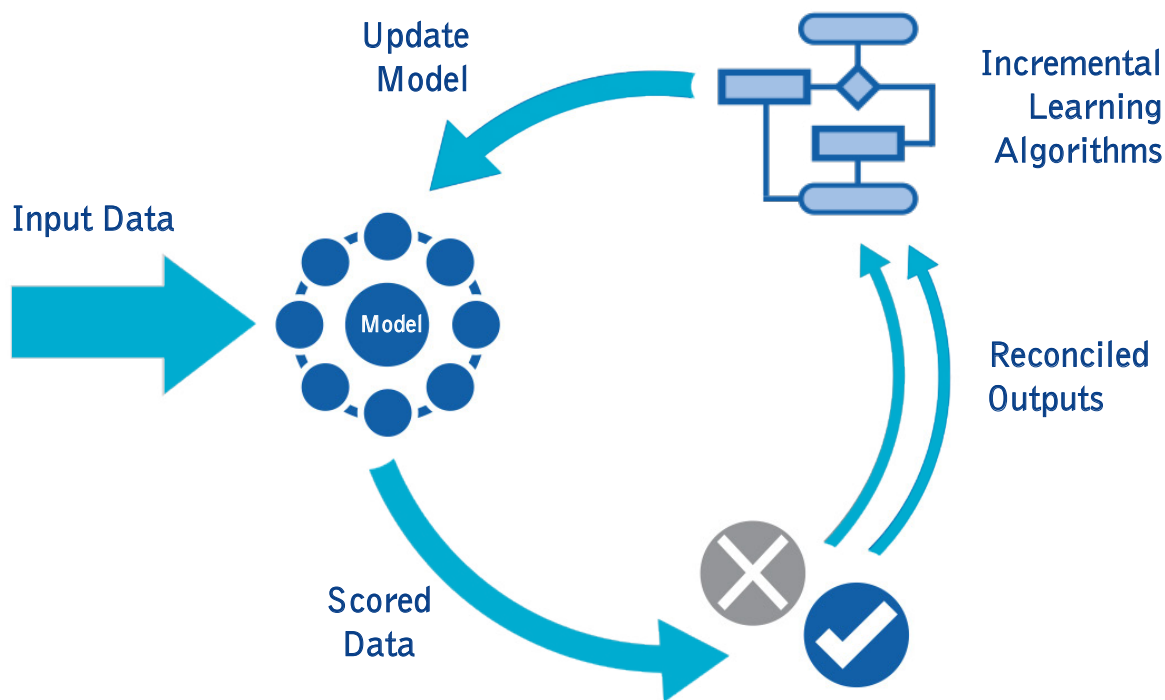
Smart-Agents are the only technology with an ability to identify and stop, in real-time, previously unknown fraud schemes. It has the earliest/highest detection and lowest false positive rates because it separately follows and learns the behaviors of each entity.

Rather than being programmed to anticipate every possible scenario or relying on predefined rules and structured queries, Brighterion's Smart-Agent technology learns, predicts, infers and makes intelligent real-time decisions.

*iPrevent evaluates, in real-time, behaviors specific to each individual cardholder, merchant, ATM, etc.*

# Getting a Grasp on Fraud in Real-Time

Detecting and preventing fraud is a dynamic and continuously evolving process. In the area of fraud prevention, there is a scarcity of effective programming technologies that address the ever changing security risks and fraud landscape. With Smart-Agent technology, companies can stop fraudsters in real-time.



Smart-Agent technology is more effective than existing technologies on the market because it allows one-to-one profiling of entities. This allows it to track every merchant, every card and every device in real-time. The agent follows the unique behavior of the entities and pulls data from across multiple channels to produce an extremely robust virtual profile that automatically aggregates all available data and refreshes itself in real-time.

The Smart-Agent uses long-term profiling to establish the baseline behavior of the entity by profiling the behavior over 1 to 24 months. The Smart-Agent also uses real-time profiling to track the same behavior but over a much shorter time period (a few seconds to a month). By creating these profiles the Smart-Agent automatically compares all behavior against the entity's baseline, as well as the baseline for related peer groups. When anomalous behavior is detected, Smart-Agents use this information to make decisions about fraud in real-time.

# Powerful Suite of Technologies

A comprehensive fraud solution must incorporate multiple complementary technologies. Brighterion's patented approach combines 10 cutting-edge artificial intelligence technologies.

## Smart-Agents

Smart-Agent technology learns the specific behaviors of an entity (card, phone, computer, individual, etc.) to create virtual representation of each individual entity. The virtual agent will continuously learn from the activities and behaviors of the entity it represents to detect any abnormal activity in real-time.

## Constraint Programming

Constraints can be added to the system that defines what is allowed or not allowed in a particular outcome. Brighterion's constraint programming provides tools that allow users to write declarative constraints.

## Fuzzy Logic

Traditional and classical logic typically categorizes information into binary patterns such as: black/white, yes/no, true/false, or day/night. Fuzzy Logic handles uncertainty in data. Fuzzy Logic is able to handle partial truths in situations where the answer lies somewhere between what is true and what is false.

## Data Mining

Data Mining extracts knowledge from data. Brighterion's suite of proprietary data mining algorithms provides a number of different technical approaches to address data cleaning, sampling, clustering, learning and classification. Brighterion's data mining can automatically generate business rules from the customer's data.

## Neural Networks

Brighterion's proprietary neural networks can translate any database to neurons without user intervention. Brighterion's neural networks are incremental and adaptive, allowing the size of the output classes to change dynamically.

## BRMS (Business Rules Management System)

Brighterion's iPrevent is embedded with a patented rule-engine algorithm which is faster than RETE and can accept an unlimited number of rules. iPrevent also provides the tools to allow non-technical experts to write declarative rules.

## Real-Time Profiling

iPrevent uses real-time profiling to evaluate behaviors specific to each individual entity (merchants, cardholders, ATMs, etc.) Profiling criteria is gathered and updated in real-time for each entity, giving Brighterion the power to stop fraud before it happens.

## Long-Term Profiling

iPrevent's long-term profiling builds a profile for each individual entity (merchants, cardholders, ATMs, etc.) to understand their normal behavior. Smart-Agents then use this base profile to detect abnormal behavior and prevent fraud.

## Case-Based Reasoning

Case-Based Reasoning is the use of past experiences or cases to prevent and detect fraud. Brighterion's Case-based Reasoning translates transactions to generic cases without user intervention. The cases created are used to evaluate transactions in real-time.

## Adaptive Learning

Brighterion's unique, self-adaptive ability allows models to learn and make effective changes at runtime. This makes our solution the only one on the market with the ability to identify and stop, in real-time, previously unknown or non-existent fraud schemes.

# Creating Custom Models

iPrevent automatically creates a predictive model based on the customer's historical information. The iPrevent model is immediately capable of preventing fraudulent transactions, including previously unidentified types of fraud.

With iPrevent, a model can be created automatically without the need for programming, IT involvement, or knowledge of artificial intelligence. Brighterion's development team spent more than 10 years making the design of models transparent and easy to use. iPrevent works with any relational database to create: The neurons, cases, Smart-Agents, fuzzy sets and data mining parameters that will best adapt to your business. iPrevent will then generate the fraud prevention engine using: Smart-Agents, decision trees, neural networks, rules, cases, real-time and long-term profiling and pattern signatures to best protect your business.

*The advantages of using these technologies are:*

### Process Transactions in Real-Time:

Score transactions in real-time (before authorization or approval) to prevent losses and protect your brand.

### Precise and Specific Behavior Analysis:

Evaluate behaviors specific to individual cardholders, merchants, ATMs, etc. in real-time.

### Stop Previously Unknown Fraud Schemes:

Unique self-adaptive capabilities detect and stop previously unknown fraud schemes in real-time.

### Best Industry Performance:

Earliest/Highest detection and lowest false positive rates on the market.

### Automatic Model Creation:

Automatically create multiple models based on region, card type, season, etc. in a single installation.

### Dynamic Deployment:

Dynamically deploy models into production without interruption to the system.

### No Imposed Data Layout:

Create and operate models using any dataset for any business need.

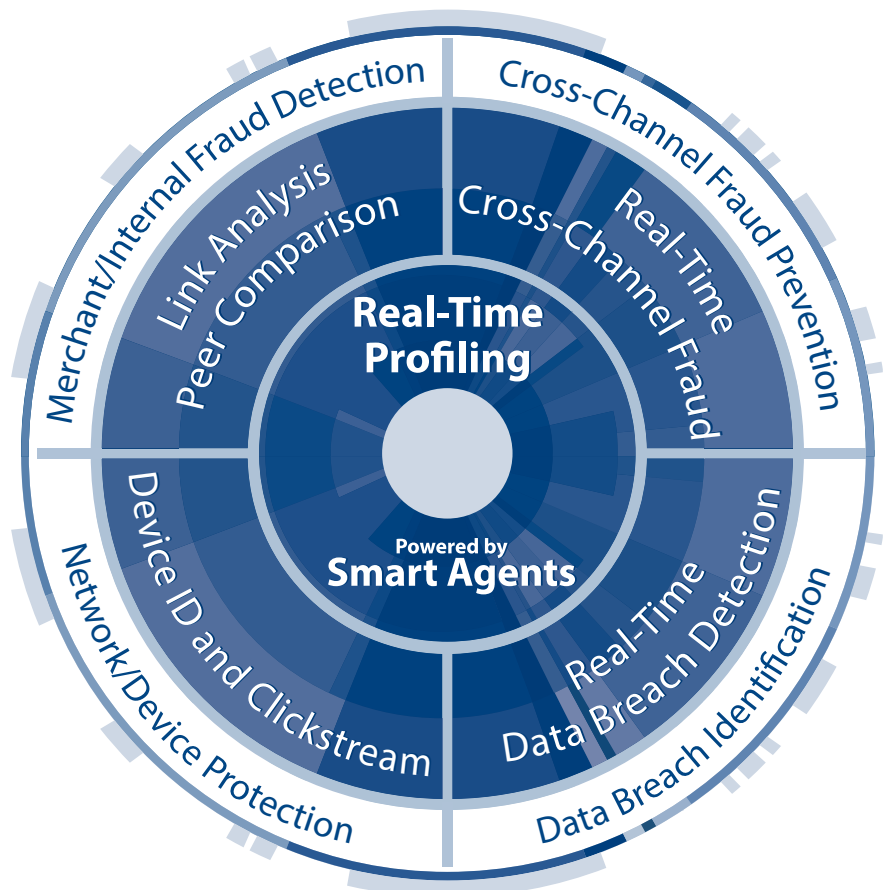
# Multi-Faceted Protection

A major limitation with current fraud solutions is the lack of real-time, multi-faceted protection. To efficiently prevent fraud, a solution must provide protection in several areas:

- **Endpoint and Navigation:**  
Uses advanced device ID and clickstream analytics;

- **User and Account:**  
Employs technologies for real-time cross-channel behavioral analysis (specific to each individual cardholder and merchant outlet);

- **Merchant and Outlet:**  
Provides real-time analysis of the relationships among internal and external entities to detect organized or collusive criminal activities or misuse.



In a world of ever-more clever thieves, where new behaviors of fraud arise daily, a smarter, multi-layered fraud prevention solution is necessary.

With iPrevent customers can manage their entire portfolio (credit, debit, ACH, wire, account takeover, online banking, etc.) on a single platform. Unlike other fraud solutions, iPrevent integrates a powerful combination of artificial intelligence, machine learning and Smart-Agent technologies to evaluate, in real-time, behaviors specific to each individual merchant/cardholder delivering results that are unparalleled in the industry. Additionally, iPrevent's unique self-adaptive ability allows models to learn and make effective changes at runtime. As a result, iPrevent is the only product on the market with the ability to identify and stop, in real-time, previously unknown fraud schemes and offers the longest lifespan on the market. iPrevent processes 6,200 transactions per second in real-time with less than a 10 millisecond response time on a single mid-range server. iPrevent is used by the leaders of the financial industry worldwide to secure billions of transactions monthly.

# Point of Compromise Detection

*Smart-Agents also collaborate in order to quickly and efficiently identify phony merchants and points of compromise.*

Specialized Smart-Agents profile cards to keep track of every place they have visited. These specialized Smart-Agents are activated by high score transactions and initiate collaborative research to find a common point of compromise. For example, Smart-Agents can be used to detect that a large volume of cards presenting suspicious behavior have all visited the same online merchant. The Smart-Agents will proactively react, increasing the risk associated with every card that visited that same merchant.

## Integration

*Brighterion's platform is based on a distributed architecture. This enables excellent performance using entry level Unix machines, obviating the need for costly hardware or a mainframe. A distributed architecture brings several benefits including:*

- Lower hardware cost: Billions of transactions per month on a single mid-range server
- Guarantees high operational availability: 99.9999% up-time guaranteed by contract
- High throughput and low response times: 6,200 transactions per second with less than 10 ms response time

This distributed architecture makes Brighterion's solution scalable and resilient to disruption because it has no single point of failure.

Built-in, intelligent routing allows the users to scale their system while still making it easy to maintain.

While promoting the benefits of a distributed architecture, the iPrevent fraud prevention solution also delivers benefits from centralized management capabilities. This enables organizations to monitor the status of any iPrevent server from a specified location.

iPrevent easily integrates with existing systems and infrastructures using industry standard formats such as TCP, ISO8583, Euronet, Web Service, etc. All communication between iPrevent servers are sent through encrypted TCP messages, ensuring customer data security.

iPrevent processes billions of transactions and records per month from various data feeds and sources. The distributed architecture of iPrevent allows us to achieve responses of 10 ms on one mid-range server.

# Everything You Need to Manage Risk in a Single Platform

In addition to iPrevent, our real-time, cross-channel fraud prevention solution enables financial institutions to secure their various portfolios, (CNP, CP, credit, debit, ACH, wire, account takeover, online banking, mobile, etc.). Brighterion also offers a comprehensive suite of products enabling customers to manage their risk and compliance on a single platform. This removes the task of integrating solutions from multiple vendors.



Brighterion offers the following products:

iPrevent:	Real-Time Cross-Channel Fraud Prevention
iDetect:	Real-Time Data Breach Detection Solution
iPredict:	Credit Risk and Chargeback Prevention
iComply:	KYC and Anti-Money Laundering Solution
iMonitor:	Adaptive Learning and Monitoring
iSecure:	Real-Time, Behavioral Device ID Solution
iLearn:	Unsupervised Learning
iSupervise:	Web-based Case Management Solution
iProtect:	Cyber/Homeland Security Intelligence

“Brighterion’s state-of-the-art technology sets it apart from competitors. Our products are built using our cognitive computing platform; the world’s most comprehensive artificial intelligence and machine learning solution that predicts, infers, and makes intelligent real-time decisions.”

**Raymond E. Kendall**

3-Time Secretary General of Interpol  
Brighterion Executive Chairman