



Probayes Multiplies its Fraud Detection Capabilities with Couchbase

Probayes was founded in 2003 and became a subsidiary of the La Poste Group in 2016. With a team of 90 employees, the company manages over 100 projects annually. Specializing in artificial intelligence, Probayes creates tailored SaaS solutions to assist businesses across diverse industries, including automotive, defense, finance, insurance, supply chain, and retail. Among its range of products is fraudIA, a solution designed to help financial institutions detect fraud in credit and debit card transactions.

Challenges

- Billions of yearly transactions, significant financial loss from fraud
- Processing capacity limits of the data science POC solution

Outcomes

- Couchbase supports 4.2 billion online transactions from 30.8 million credit cards annually
- Using 900 indicators to assess the fraud potential of a banking transaction
- 450 banking transactions analyzed per second, with 30-50ms processing power for each transaction

Industry

Financial services

Customer application

 FraudIA application for fraud detection

Use case

Real-time analytics

Product

Couchbase Server

Key features

In-memory caching



"We are extremely pleased with the Couchbase solution, which has significantly enhanced our processing capacity and enabled us to seamlessly handle the substantial growth in transaction volume."

- Mohamad Othman Abdallah, TechLead Architect, Probayes

THE CHALLENGE: IDENTIFYING FRAUDULENT CHARGES ACROSS BILLIONS OF YEARLY TRANSACTIONS

With 76 million credit cards in circulation, the number of annual transactions in France is estimated at 20.5 billion. Online shopping continues to increase – the French Federation of E-Commerce and Distance Selling (FEVAD) reported a 5% growth in online purchases last year across over 2.3 billion transactions.

As the preferred payment method in the country, credit cards now account for over 93% of fraud cases. In 2023 alone, fraud resulted in an estimated loss of 496 million euros, according to the Payment Security Observatory's annual report from the Bank of France. This presents significant risks for a wide range of stakeholders, including cardholders, insurance companies, financial institutions, and merchants. To address these challenges, Probayes developed fraudIA, a predictive AI solution designed to help financial institutions combat fraud more effectively.



THE SOLUTION: ACHIEVING REAL-TIME ANALYSIS GOALS AND PREPARING FOR SCALABILITY

The fraudIA solution combines three distinct machine learning models tailored to three types of transactions: remote sales (VAD), withdrawals, and payments. Developed in partnership with client banks, including La Banque Postale and Société Générale, fraudIA utilizes over 900 indicators to evaluate the potential fraud risk of each banking transaction. These indicators cover various aspects, such as the cardholder's profile (age, card type, etc.), the details of previous transactions (frequency, time lapse, etc.), the specifics of the current transaction (location, currency, time, amount, etc.), and transaction history over the past 30 days (amounts, volumes). Based on this analysis, fraudIA generates a fraud probability, and depending on the threshold set by the client bank, the transaction is either flagged for review or allowed to proceed. As such, the solution enhances and complements existing fraud prevention systems.

"fraudIA is an evolving product, one that we are constantly striving to improve, by considering new indicators in collaboration with our clients' business teams," explains Mohamad Othman Abdallah, TechLead Architect of fraudIA at Probayes. As global transaction volumes continue to grow exponentially, Probayes must scale its systems to more effectively assess risks. During the proof-of-concept (POC) phase, the machine learning models were built using a PostgreSQL database. However, to support industrial-scale operations and overcome the processing limitations of previous technologies, Probayes opted for Couchbase in its solution architecture. The decision was driven by Couchbase's high-performance and real-time capabilities. The primary use case involves leveraging the database's key-value store to enable quick access to cardholder and feature-related data.

THE RESULTS: SUPPORTING SCALING AND SUSTAINING FUTURE PERFORMANCE

By upgrading from Couchbase Community to Couchbase Enterprise, Probayes not only gained access to expert support from Couchbase's teams but also doubled the number of nodes, enhancing the resilience and availability of its infrastructure. Leveraging Couchbase's in-memory capabilities significantly reduced the duration of each operation. As a result, fraudIA's processing capacity now handles 450 transactions per second – more than double its previous throughput – while maintaining transaction times between 30 and 50 milliseconds. Mohamad Othman Abdallah, the lead architect for the project at Probayes, expressed his satisfaction: "The Couchbase solution enables us to scale with ease."

The Couchbase team played a central role in the migration project, assessing system size, forecasting installation and configuration timelines, and collaborating closely with the Probayes team to define the optimal architecture for scaling fraudIA. Ongoing support is provided to review performance every six months and address any technical or skill development needs.

The next phase will involve migrating the systems to a Kubernetes environment, where Couchbase Autonomous Operator will manage the cluster. This will support the growing application load and further improve processing capacity and real-time analytics, ensuring scalability regardless of the transaction volume processed per second.

Modern customer experiences need a flexible database platform that can power applications spanning from cloud to edge and everything in between. Couchbase's mission is to simplify how developers and architects develop, deploy and run modern applications wherever they are. We have reimagined the database with our fast, flexible and affordable cloud database platform Capella, allowing organizations to quickly build applications that deliver premium experiences to their customers – all with best-in-class price performance. More than 30% of the Fortune 100 trust Couchbase to power their modern applications. For more information, visit www.couchbase.com and follow us on X (formerly Twitter) @couchbase.

