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CASE STUDY

How MasterCard Uses AI for Fraud Detection.docx

Background

In an age where digital payments act as the backbone of global commerce, security has become the number one priority of financial institutions worldwide. With the journey towards digital transformation, the progress in online transactions has been phenomenal, and so has the growth in fraudulent activities. States such as MasterCard, which are among the top names in global payments, have recognized the urgent need for financial transaction conduct while fortifying them with appropriate technology.

The analysis focuses on how MasterCard uses Artificial Intelligence (AI) to prevent fraud detection and secure its massive daily transaction volume across all platforms. With such pioneering constructs as Decision Intelligence Pro and behavioral analysis mechanisms, in addition to the recent acquisition of Brighterion AI and biometrics-based solutions, MasterCard has set the bar.

Organization Name

MasterCard Incorporated

Target Industry

Financial Services – Digital Payments and Transactions

Problem Statement

A global leader in payment solutions, MasterCard helps facilitate 125 billion transactions annually across more than "210 countries and territories." The business offers its services under credit cards, debit cards, prepaid cards, digital wallet, contactless payments, and cloud-based payment systems umbrellas. Its ambitious goal of getting 1 billion users and 50 million businesses engendered into the digital economy by 2025 exemplifies the scale at which the organization operates.

But with this enormous volume comes an equally enormous risk: payment fraud.

Fraudsters continue developing ways to easily take advantage of the loopholes on the part of the financial ecosystem. MasterCard was quite painfully under increasing threat from many types of complex fraud, such as:

1

Card-not-present (CNP) fraud

Transactions that take place without the physical card and are made with stolen card details.

2

Account takeover (ATO) fraud

Unauthorized control of a legitimate user's account.

3

Synthetic identity fraud

Fraudsters create fake accounts using false credentials.

4

Chargeback fraud

Consumers falsely claim they didn't make an authorized transaction.

Old-time rule-based algorithms were no longer able to present sufficiency in detection and prevention. They were neither adaptable nor speedy enough to fight fraud patterns that constantly evolved. A better, advanced, real-time, self-learning solution is the requirement due to the scale and sophistication of the threat.

Proposed Solution

To effectively tackle the increasing complexity of fraud risks, MasterCard has decided to deploy Artificial Intelligence (AI) and incorporate different AI-powered tools and techniques into its already strong fraud detection ecosystem.

Come; let's uncover how MasterCard incorporated AI into its entire fraud detection framework:

1

Decision Intelligence Pro: An AI-Powered Fraud Detection System

The center of MasterCard's fraud defense system is Decision Intelligence Pro. The advanced AI-driven solution analyzes and checks for each transaction in real-time based on things like:

- Transaction history
- Device fingerprinting
- Merchant reputation
- Buying behavior
- Geolocation and IP address data

Utilizing state-of-the-art supervised machine learning models trained on 125 billion transactions, Decision Intelligence Pro processes a transaction in just 50 milliseconds. Each transaction receives a fraud score based on its risk level assigned to it. If it exceeds a preset cutoff score, the transaction is flagged as suspicious and rejected or referred for further human examination.

The speed of decision-making prevents attempted fraud before it can materialize into an actual financial loss.

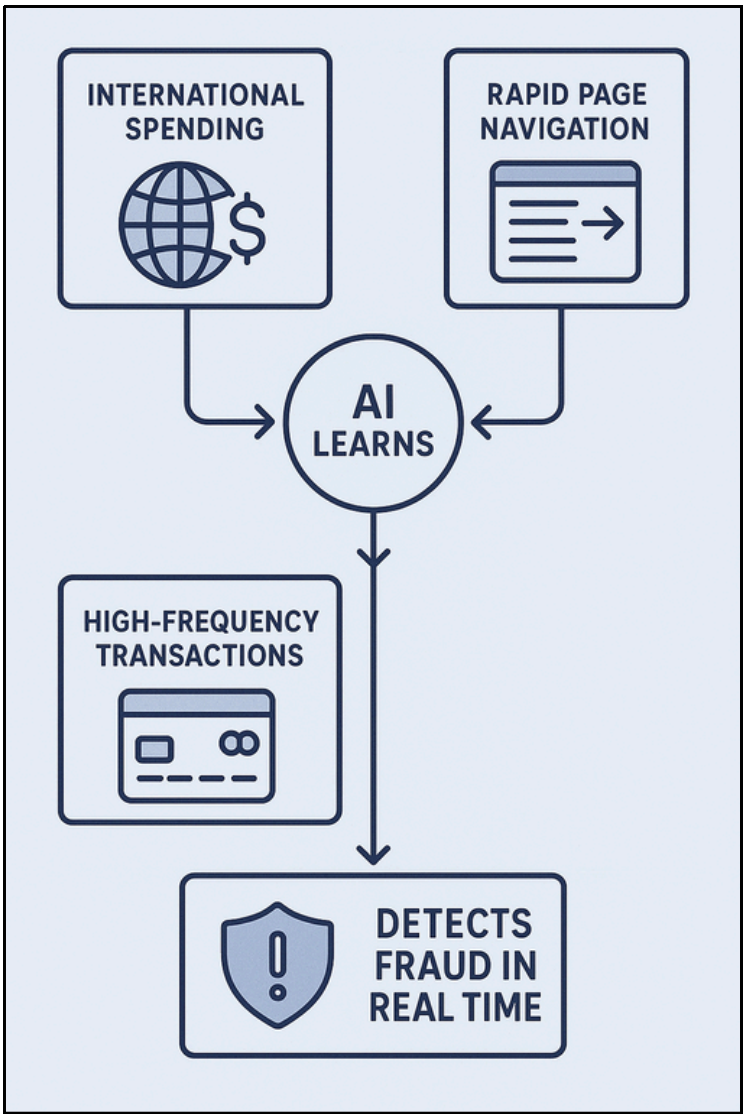
2

Behavioral Analytics Using AI

It empowers you to understand the behavioral patterns of customers to prevent fraud.
To this end, MasterCard's AI models are constantly learning about the user behavior in spending behavior, detecting oddities such as:

- International spending within the land by customers who usually normally spent within the land.
- High transactions are suddenly recorded by accounts that usually made low transactions.
- Multiple transactions are processed on the same card within minutes from varied locations.
- Phony transaction patterns such as typing speed or fast navigation across multiple pages.

The new behavioral knowledge available to MasterCard continuously upgrades its AI into the changing patterns of users with possible deviation detection in real-time.



3

Acquisition of Brighterion AI

MasterCard further fortified its capacities in AI with the acquisition of Brighterion AI, a neural network-based platform. Brighterion's AI comprises the ability to analyze millions of data points in seconds to model patterns of fraud and anomalies with extreme precision.

Moreover, self-learning means the platform is continuously improving its fraud detection algorithms to stay a step ahead of new threats and changing methodologies of fraud. Brighterion AI works together with Decision Intelligence Pro to build an intelligent, layered defense.

4

Combining AI with Biometrics

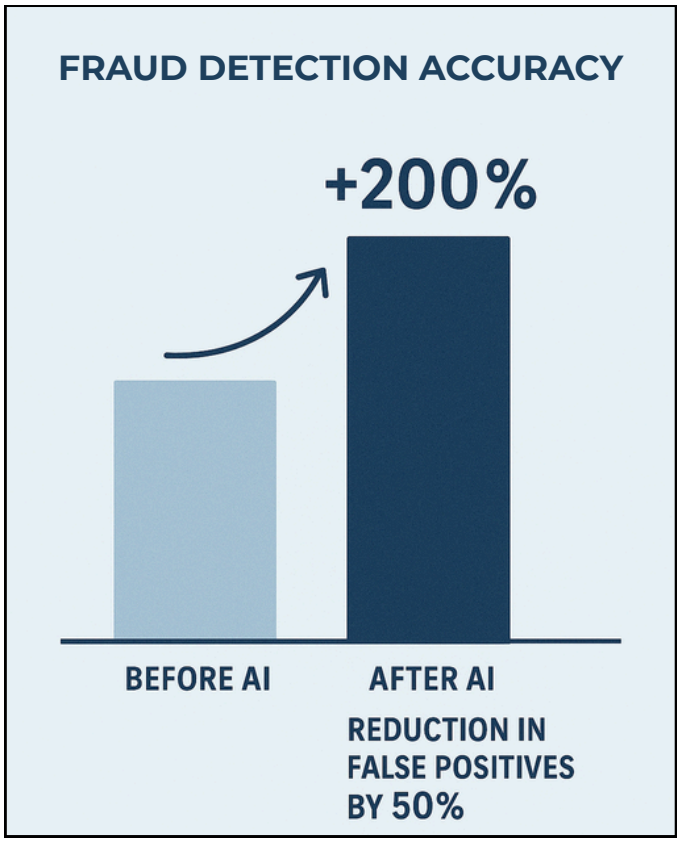
MasterCard has come out with several initiatives that integrate biometric technologies with AI to improve transaction security. Techniques used comprise:

- Fingerprint recognition
- Facial recognition
- Behavioral biometrics

Additional verification procedures will be triggered during a transaction when an unusual biometric pattern or any deviation from typical behavior is detected. This ensures that extra biometric protection layers are in place, thereby further securing a compromise of personal information.

Outcome

MasterCard's AI initiatives have produced extraordinary results.



With real-time fraud detection mechanisms in place, MasterCard has accomplished the following:

- **Improvement in fraud detection accuracy by 200% :**

  AI tools allow many more fraudulent transactions to be caught before the event.

- **Reduction in false positives by 50% :**

  The false marking of legitimate transactions as fraudulent has been reduced by half, thus building customer trust and satisfaction.

- **Transaction analysis in real time :**

  Transactions are processed and analyzed in less than a second, or in under a second, to create a seamless experience for the customer.

- **Annual savings of $20 billion :**

  MasterCard instills a belief that billions of dollars that would have been lost in fraud are saved through fraud prevention.

Amazing summation by Ajay Bhalla, MasterCard's President of Cyber & Intelligence:

"AI is a game-changer in fraud detection. It allows us to detect and stop fraud before it happens, ensuring trust in digital transactions."

Key Takeaways

1

AI Revolutionizes Fraud Detection

MasterCard has been able to demonstrate how the transformation of fraud detection through AI can usher fraud detection from a reactionary to a proactive state. With tools like Decision Intelligence Pro and Brighterion AI, MasterCard developed an evolving real-time self-learning framework in fraud detection for the organization.

2

Behavioral Analytics

Understanding user behavior entails sorting out what is real and, therefore, suspicious actions and differentiating AI learning and adaptations from an anomaly detection rules-based system.

3

Bifurcation of Human-Linked Components Security by AI Strengthens

The inclusion of biometric authentication with an AI-enabled solution adds another barrier to entry and therefore thwarts a fraudster from carrying out any of their activities on behalf of a client.

4

It Cuts So Much Cost with AI

Almost all customers experience aspects are enhanced with the different measures MasterCard has put in place to curb fraud and false positives, which in turn translate to an overall annual yearly saving of an estimated $20 billion.

5

Futuristics by Self-Learning Models

Fraud detection systems evolve alongside the tactics of cybercriminals due to the self-learning models. It is extremely important for them in environments where fraud techniques are always dynamically upscaling.

6

Scalable Solution for a Growing Ecosystem

At this scale and speed, fraud detection systems can continue capturing their ever-increasing number of users optimized for non-collision-failure transaction processing. Precision and speed will enable the systems to accommodate millions of transactions per day without compromising security.

Conclusion

Mastercard is an ideal case study for AI programs aimed at tackling financial fraud at scale. Being a company responsible for more than 125 billion transactions every year, they can no longer ignore the rising tide of cybercriminal threats and have required a flexible and intelligent solution. AI provided all of that and more.

From Decision Intelligence Pro to behavioral analytics, Brighterion AI, and biometric integration, MasterCard has managed to create a multi-level fraud detection system capable of comprehensively tackling fraud. These have paid off with several remarkable achievements- smashing 200% improvement in detection accuracy, reduced false positives, real-time processing, and colossal financial savings.

The end of this story is not yet determined.
As the fraudsters continue to revise their schemes, such systems should never cease being ahead of them. This is something that is well understood by MasterCard as it continues to evolve its AI models into advanced horizons. Emerging technologies such as blockchain and quantum computing hold the promise of future stronger fraud prevention technologies.

Stands the broad lesson to the entire financial industry: innovation, real-time analysis, and adaptive learning models shall keep one ahead of fraud. What made MasterCard's strategic application of AI so successful could be legitimized as a blueprint for any organization trying to make headway in securing user base membership and user trust towards its integrity in financial ecosystems.

Through AI-powered transformation, it secures billions of dollars for itself as well as builds confidence in the digital economy, which is what MasterCard is doing. Its large strides in AI-enabled fraud detection show what the future looks like for secure, smart financial transactions.

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