Scam Detection models on an internal machine learning platform

Credit Scoring and Credit Control Conference XVIII

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Version 1.0

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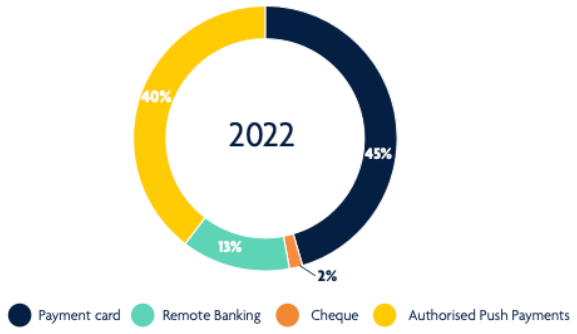
Agenda

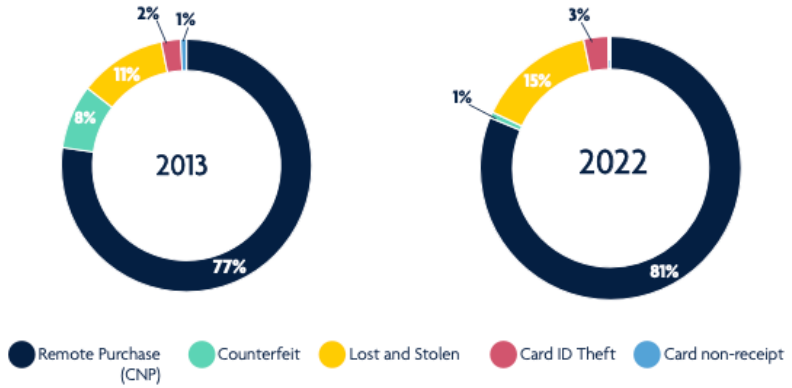
1. Introduction
2. Fraud and Scams
3. Portfolio
4. Model Development
5. Fraud Machine Learning Platform
6. Conclusion and Takeaways

Introduction

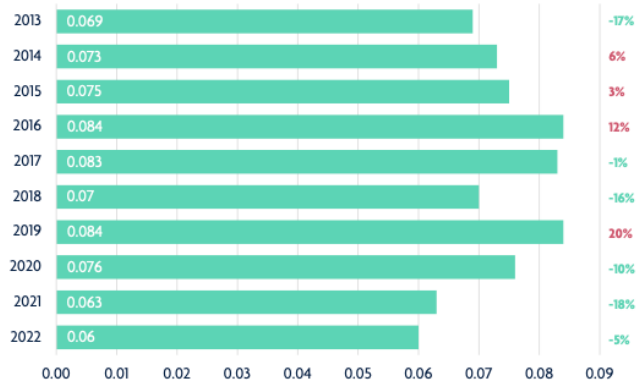
Total 2022 Financial Fraud Losses by type of percentage total



Card Fraud Losses 2022 split by type as percentage of total losses



Fraud to Turnover Ratio



Background*

- Despite the banking industry's annual expenditure of billions of pounds to contrast fraud, 2022 figures shows that ~£1 billion was stolen through fraud.
- 40% of crimes in England and Wales are fraud related, the banking sector is at the fore front of this battle to tackle fraud activities.
- This year fraud losses were down 8% compared to 2021. Unauthorised fraud losses accounted for £726.9million with just 1% decrease from previous year.
- Implementation as Strong Customer Authentication SCA and payee confirmation have had a significant impact in curbing fraud but more needs to be done.

* Source: Annual Fraud Report 2023, UK Finance

How we address Fraud and Scams at Barclays

- Barclays retail banking portfolio involves all non-plastic transactions from a Barclays account.
- Fraud and scams rates are between 0.009% and 0.0013%.
- Barclays has developed an internal machine learning model deployed on an in-house transaction platform.
- Performances are measured on a regular basis using Transaction Detection Rate (TDR), Value Detection Rate (VDR) and Genuine Detection Rate (GDR).

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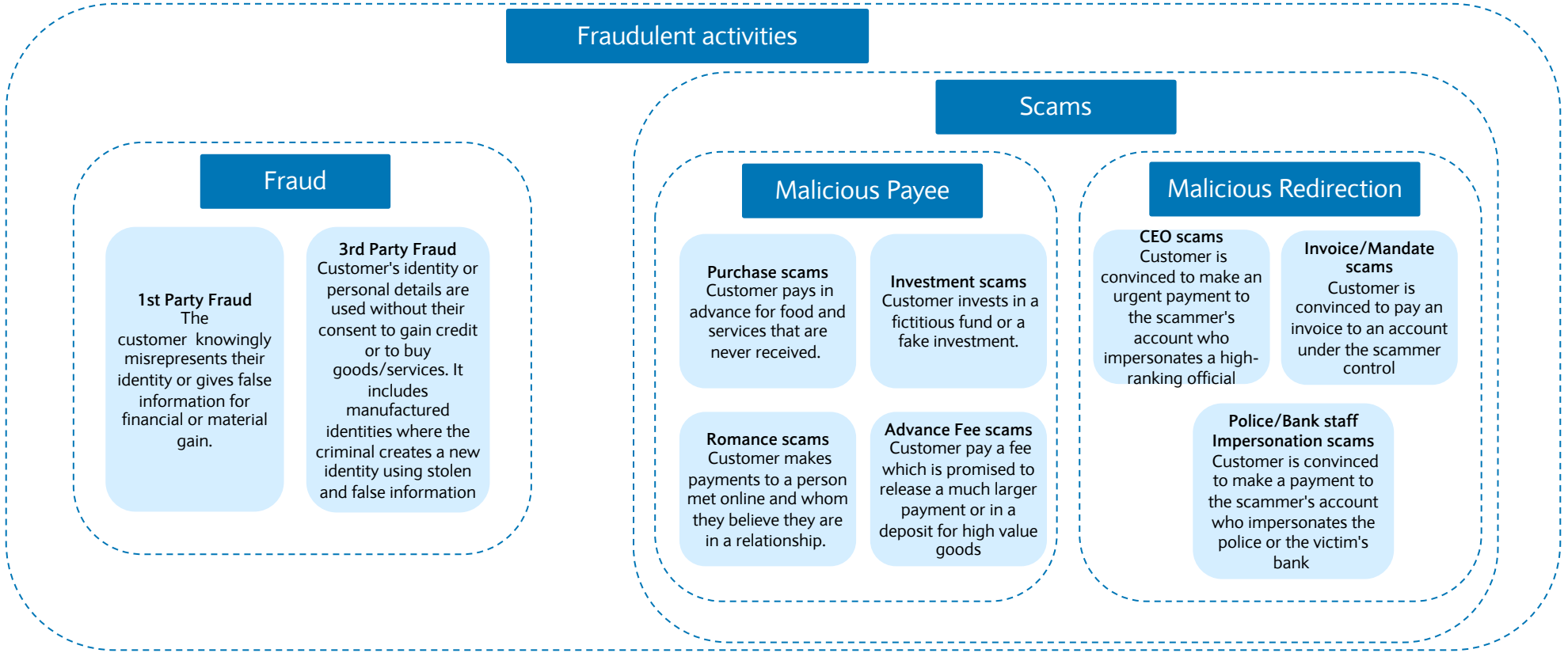
Fraud and Scams

Frauds and Scams are deceptive practices designed to **gain financial or personal benefits dishonestly.**

- There are different types of fraud and scams. Scams, in particular, have become more prominent and take a multitude of forms.
- UK has become a world technology hub for detection. This trend is driven by banks and the success in preventing unauthorised frauds.
- Barclays is pioneering on the use of machine learning models. Those are proven to be able to catch non-linear relationships within data compared to traditional rule-based models.



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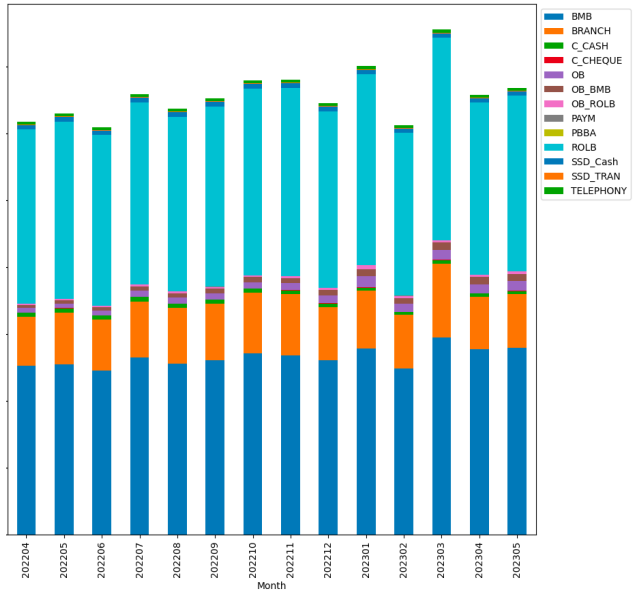
Portfolio Information

BUK Retail Banking Portfolio includes all third parties transfer made by a Barclays account

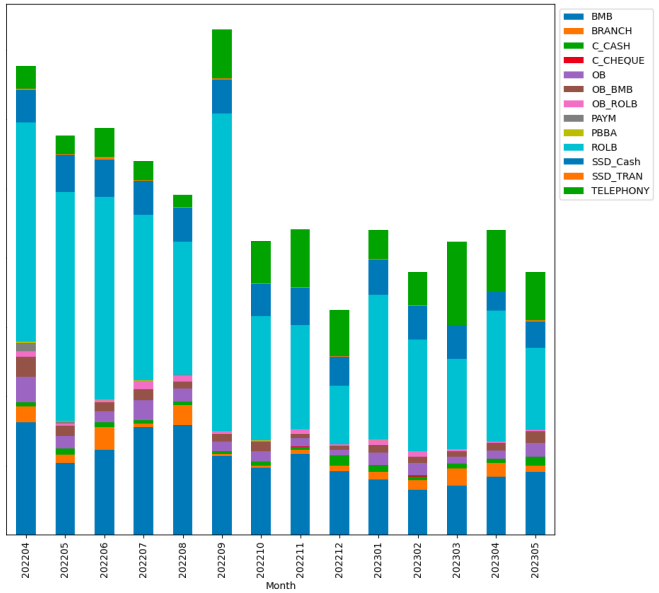
- The Retail banking model focuses on digital, non-digital channels and self-services devices.
- Channels have different volume of transaction and consequently different fraud and scams rates

Digital	Non Digital	Self Service Devices
• Barclays Mobile App • Barclays Personal Banking Website • Pay by Barclays App • OpenBanking	• Branch • Telephony • Counter Cash/Cheque	• SSD Cash • SSD Transfer

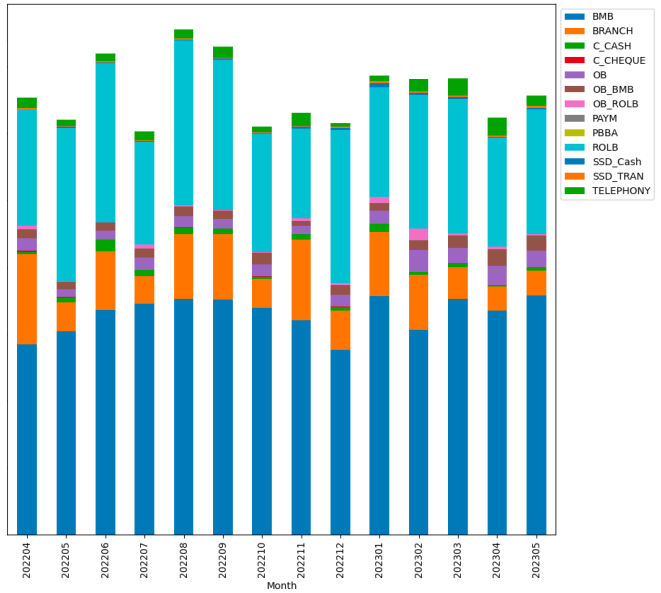
Total Value of Transactions by channel



Fraud Value by channel



Scam Value by channel



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BUK Retail Banking Transactions Model

Model TDR and VDR outperform current live vendor model by ~ 30% and ~ 22% respectively

Scope

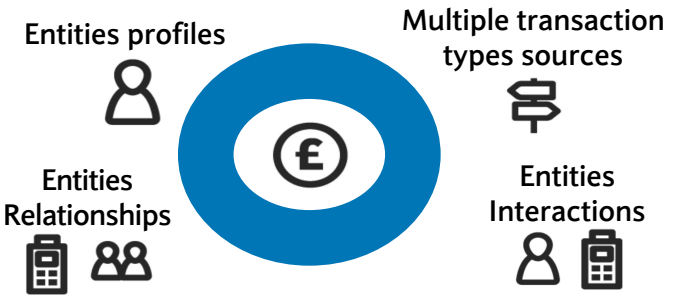
- Predict the likelihood of the BUK Retail transactions to be fraud or scam, blocking the transaction if high risk
- Score live transactions using the Barclays Fraud Machine Learning platform (FML)

Modelling Approach

- Stratified downsample applied to development sample.
- Profile and historical views built through feature engineering.
- Developed different challenger models to find the best performing one through KPI's analysis.
- Test different machine learning techniques like model blending.

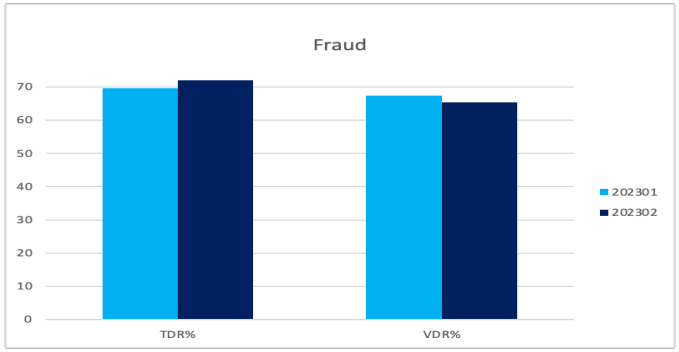
Feature Engineering

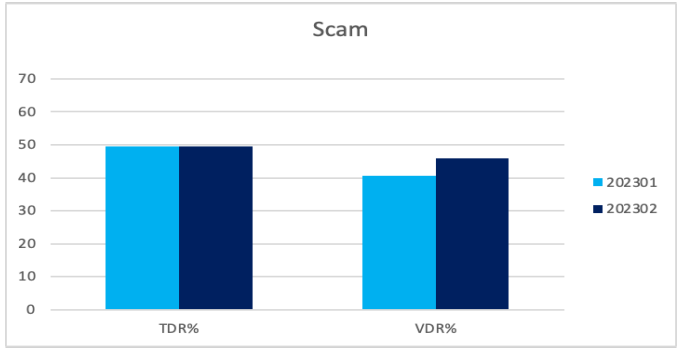
- In-house features used in the model based on several profiles.
- Thousand of features developed based on different profiles considering different historical time periods.
- Profiles are combined to generate more information on the transaction.



Results

- Final model is a picked among different machine learning models with best performances, score stability and interpretability.
- TDR and VDR measured on recent data.





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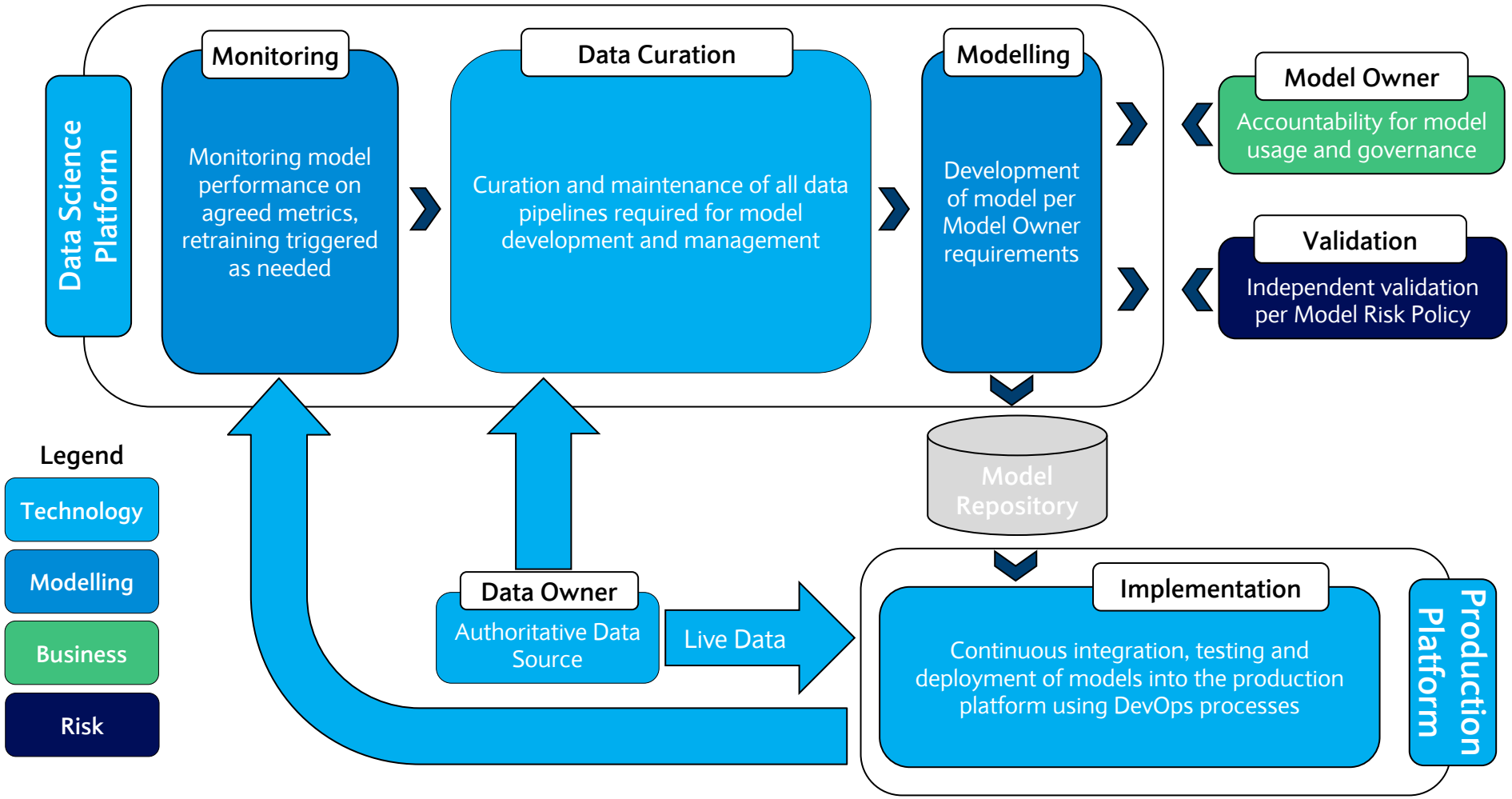
Fraud Machine Learning – Internal Model Development

To reach beyond ML proof of concepts we have built an end-to-end ML operating model



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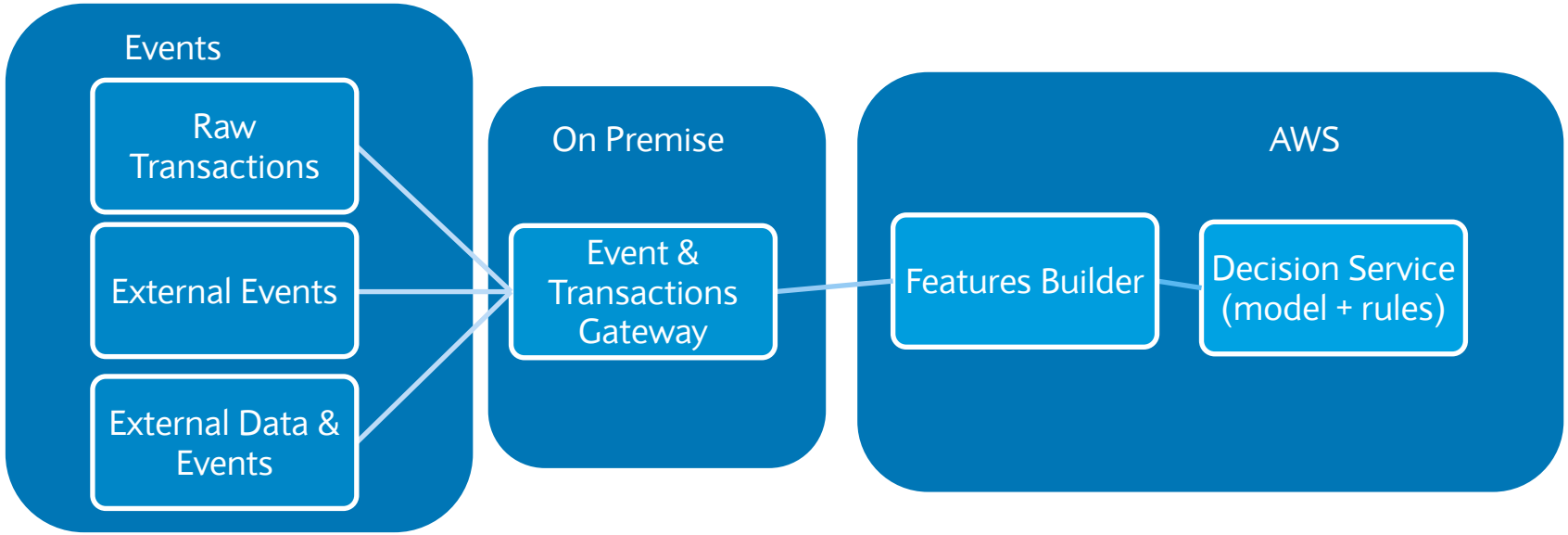
Fraud Machine Learning – Production Platform Overview

On Premise platform meet all performance, scalability ,availability and security regulatory standard

Platform Objectives					
Build a Fraud Machine Learning Platform	Apply ML interpretable techniques	Replace legacy systems	Meet all performances, security, scalability and availability Bank and regulatory standards	Reduce reliance on vendors models	Build high-performance low-latency E2E solution



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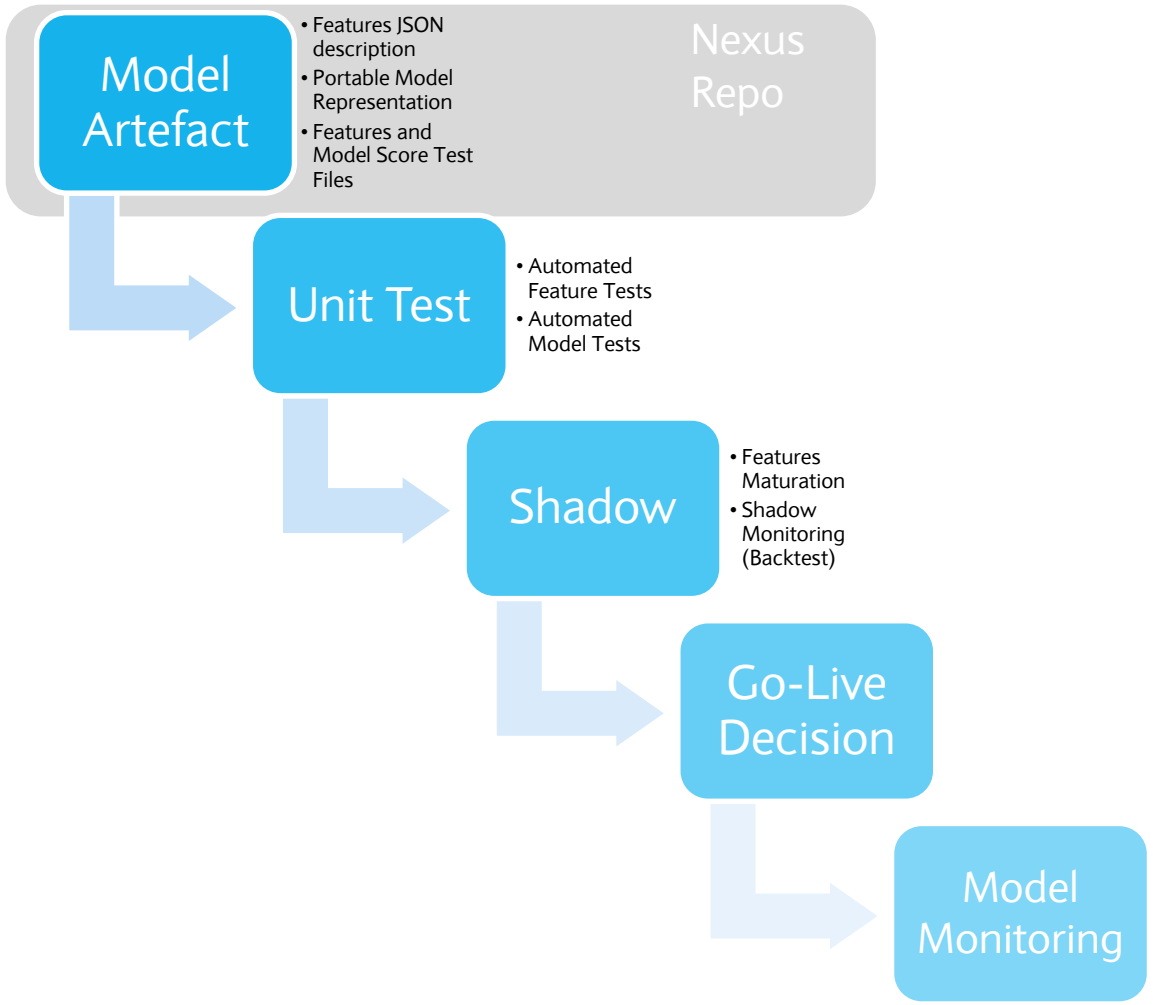
Fraud Machine Learning – Programme Overview

Aim for maximum automation to reduce risk and increase time to market



Language Agnostic Model

Testing

Models comparison Prod vs Shadow

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Conclusion and Takeaways

1. Machine learning techniques used to detect fraud and scam demonstrates to be a powerful solution
2. Profile definition to enhance information on transaction event are crucial to the model development process
3. On-Premise platform model implementation enhance the control and reaction on new fraudulent modus operandi
4. Internal Model Development and On-Premise platform give more control and more transparency
5. Security on customer data storage is enhanced and higher control on customer data usage is guaranteed