

Fraud Detection

Data Exploration Project WWI18SB

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What is Mobile Fraud?

01

Introduction

Mobile Fraud

Fraudulent transaction
made by an unauthorized
person on someone
else's account while the
acountholder and its
provider are not aware of
it at the time of its
realization



**Why is it
relevant?**

02

Economic Perspective

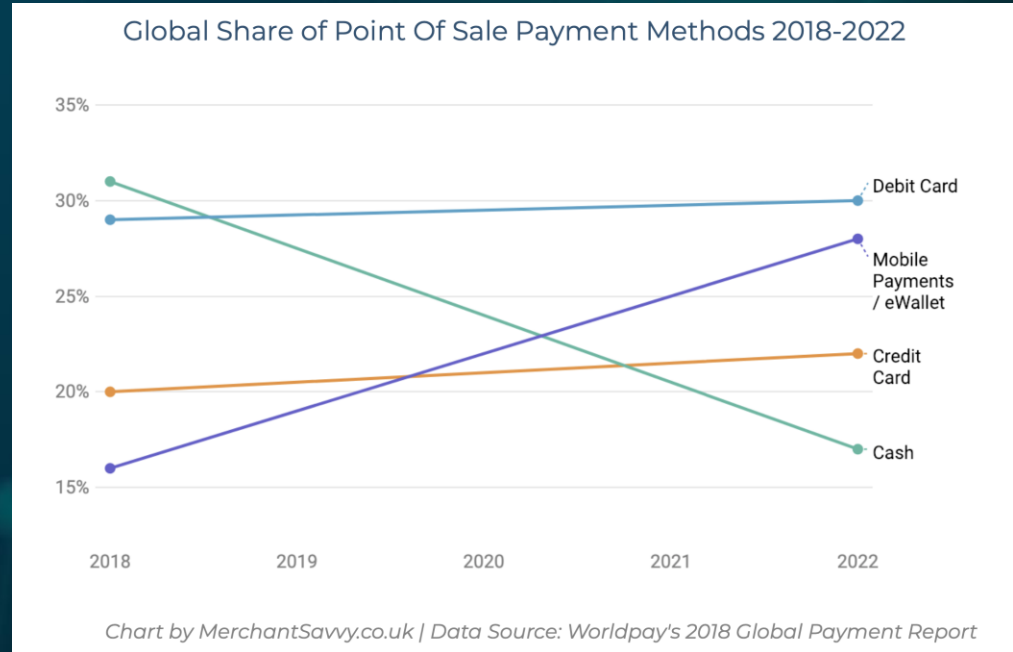
WHY IS IT RELEVANT?



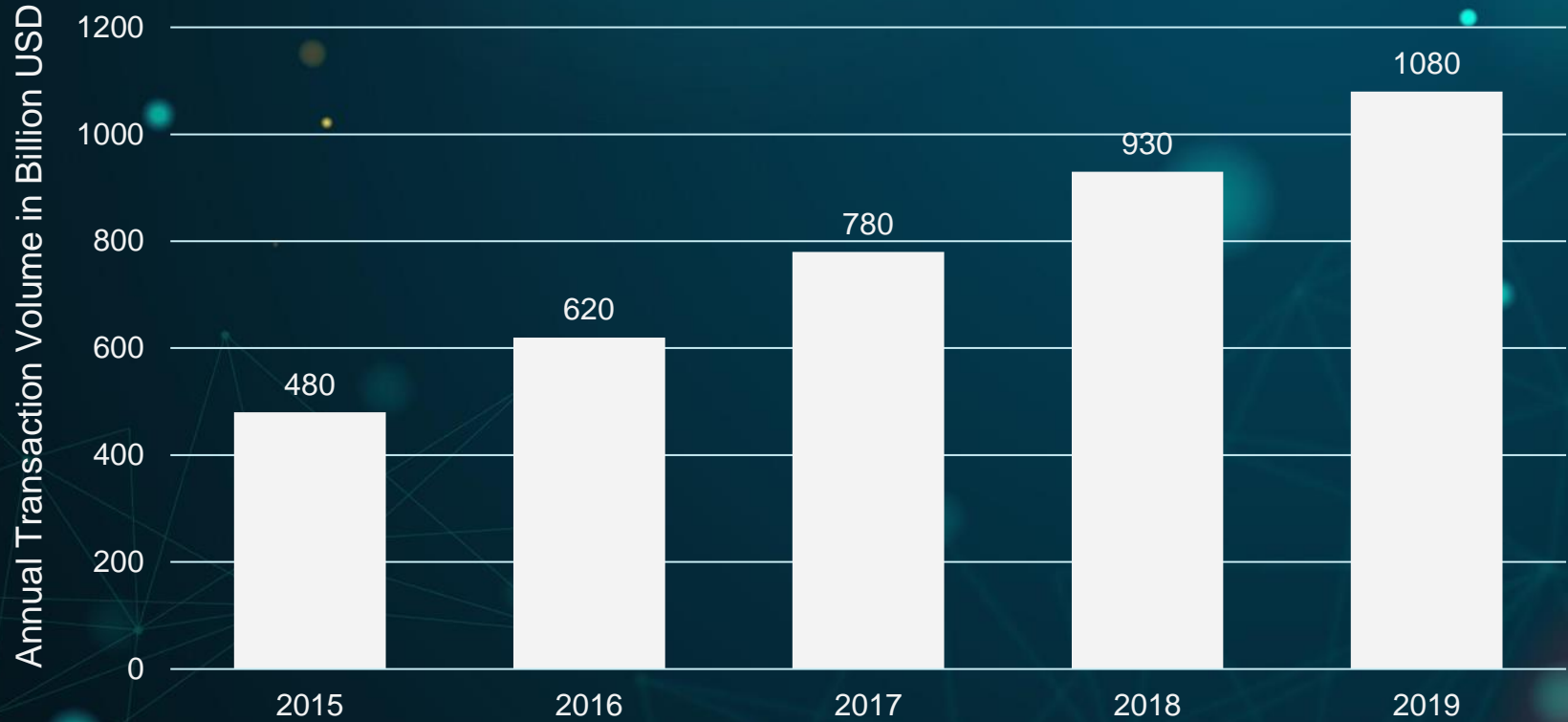
New technologies and consumer behavior result in millions of payment transaction every day



Mobile payment is the one of the most predominate payment methods



Total Revenue of global mobile payment market from 2015-2019



THE STATS

Mobile apps source of
only 5% of fraudulent
online transactions

2015

2018

Mobile apps source of
39% of fraudulent online
transactions

Total Value of mobile
payments reaches one
trillion USD

2020

2021

Number of mobile user
will reach 7 Billion
worldwide

Related Work

03

What has been done so far?

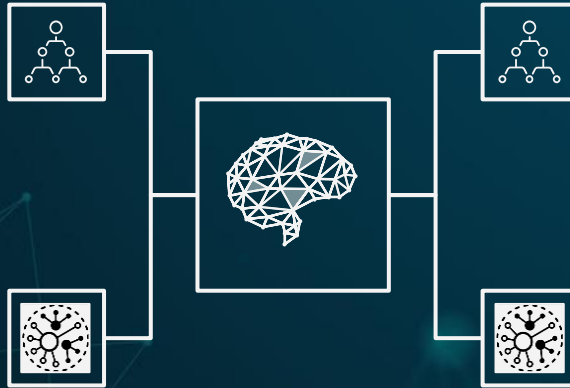
Related Work

Classification using a
Random Forest Algorithm

M. Suresh Kumar (2019)

Husojinovic (2020)

Combined approach of
Naïve Bayes and a C4.5
Decision Tree



Classification using a
Random Forest Algorithm

D. Meenakshi et al. (2019)

**Bharati Vidyapeeth's
College of Eng. (2018)**

Combined approach on
Naïve Bayes and KNN

The Dataset

04

Where is the data from?

Where is the data from?



The Company

- Based in Africa
- Operates internationally in over 14 countries
- Customers can make mobile payment transactions

What data do we have?



The Entities

Step

Unit of time in the real world

Type

Type of Transaction

Amount

Amount of transaction in local currency

isFraud

Identifies a fraudulent transaction

nameOrig

Customer making the transaction

oldbalanceOrg

Customer balance before transaction

newbalanceOrg

Customer balance after transaction

isFlaggedFraud

Flags illegal attempts to transfer too much money

nameDest

Recipient ID

oldbalanceDest

Recipient balance before transaction

newbalanceDest

Recipient balance after transaction

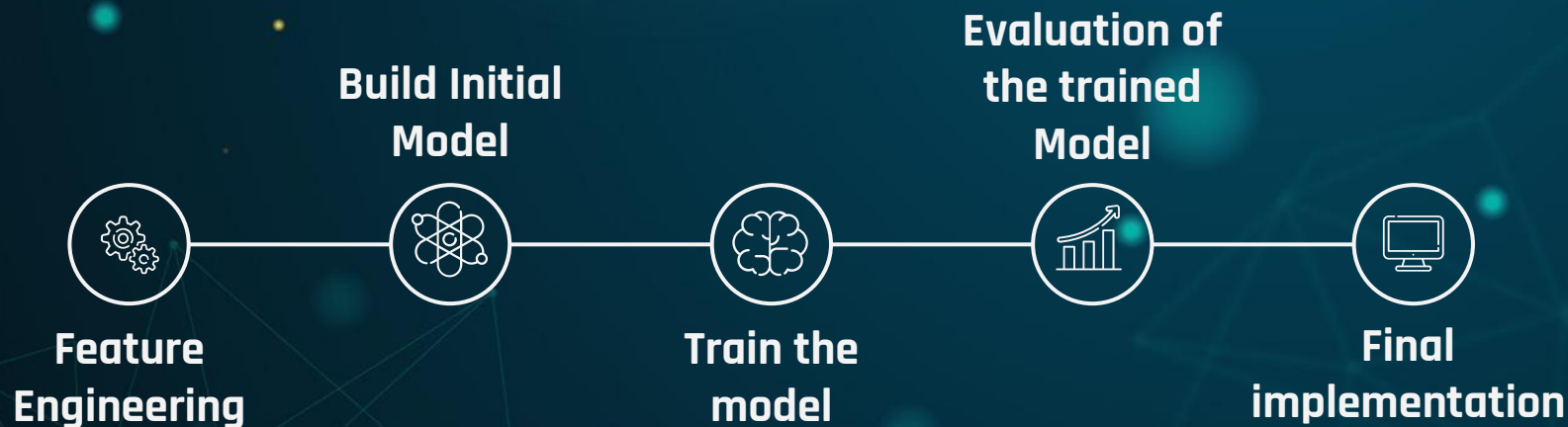
Our Work

05



How does our model work?

What did we do?



Feature Engineering

Percentage change of the
customers account balance

PctChangeOrg

HourOfTheDay

Time of day in hours –
derived from the entity *step*



Shows the proportion of
transactions to the recipient

relativePctTxToDest

Type

represented transaction types -
was coded with its characteristics
to dummy variables

What algorithm did we use?

Ensemble of a large
number of uncorellated
decision trees



**RANDOM
FOREST**

Standard model for
binary classification that
models a probability
outcome for a class



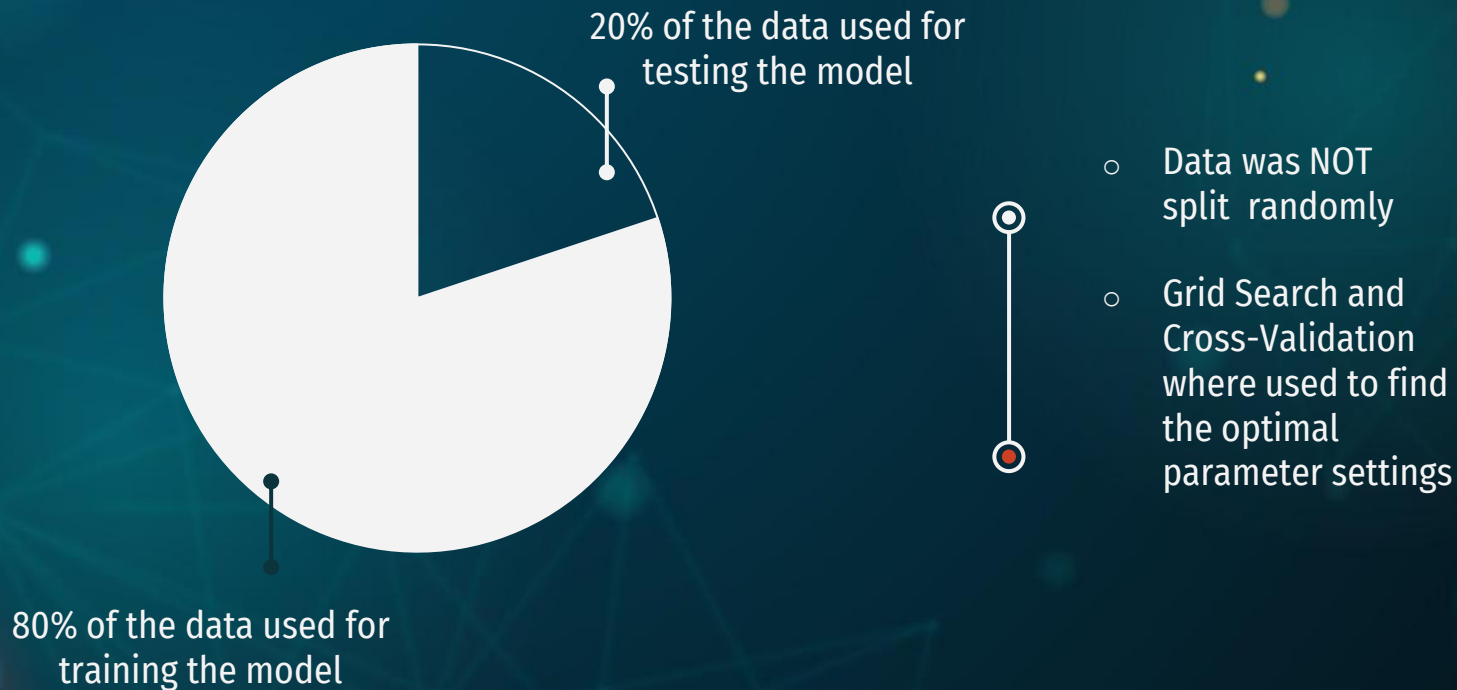
**LOGISTIC
REGRESSION**

Binary Classifier that is
used to find the best
separating hyperplane



**SUPPORT VECTOR
MACHINES**

Training and Validation



Evaluation of the models

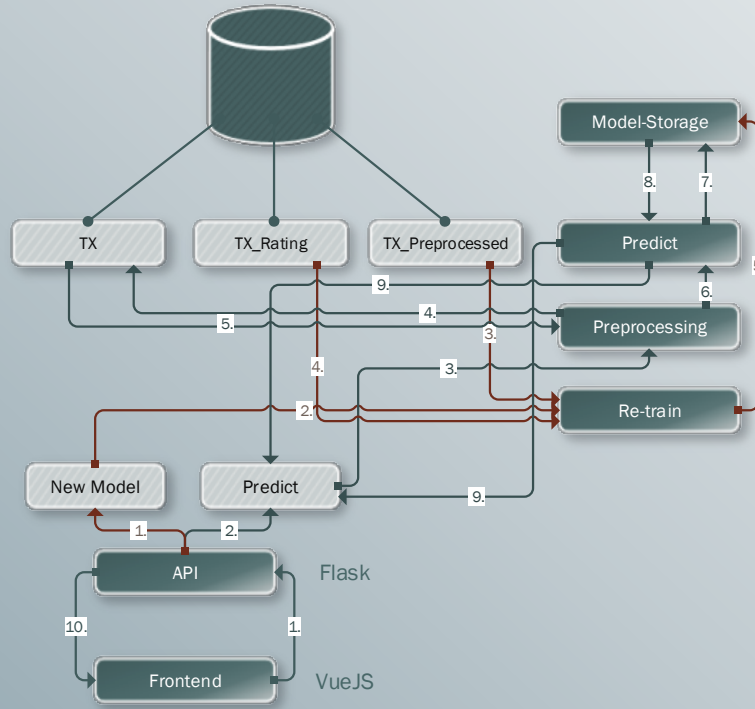
	F1-Score	Average Precision	AUC Score
Random Forest	0.99976	0.99953	0.99999
Logistic Regression	0.65353	0.45305	0.96342
Support Vector Machine	0.88205	0.78382	-



6,684 Mrd. USD

worth of fraudulent transactions were correctly blocked by our model during testing

The final architecture





Demo

06



This is how it works.

Sources

<https://www.statista.com/statistics/226530/mobile-payment-transaction-volume-forecast/>

<https://dataprot.net/statistics/mobile-banking-statistics/>