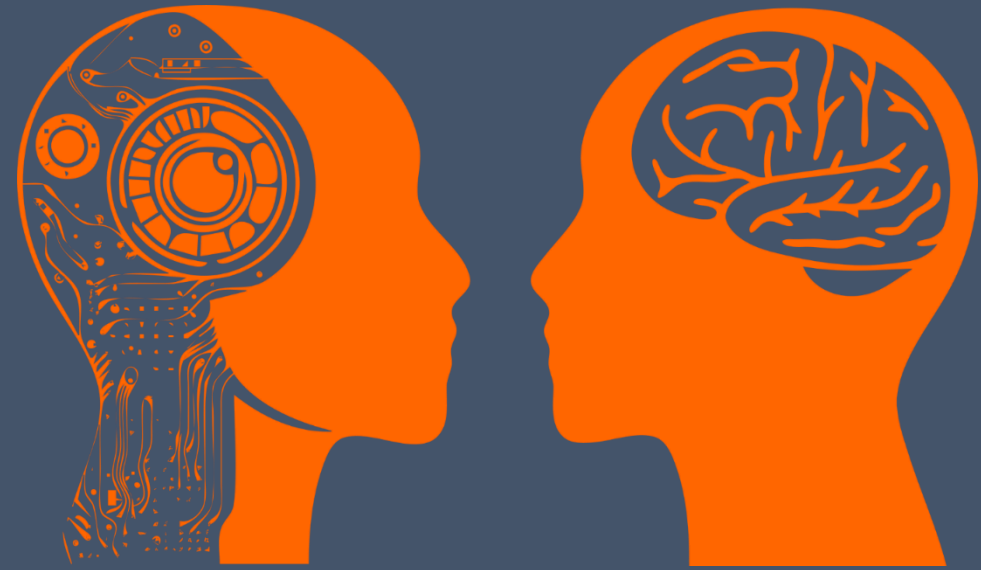


**LEAVE INNOVATION  
TO OTHERS:  
ONE YEAR OF AI IN LUXEMBOURG**

Ed Moman

March 2024



## THE GOALS

Make data accessible, insightful and actionable

Seamlessly integrate human and artificial intelligence

# SELECTED PROJECTS

## DATA ANALYSIS

- ➔ GEOIP
- ➔ Crypto Execution Performance
- ➔ Hierarchical Exchange Tree

# PROJECT: GEOIP

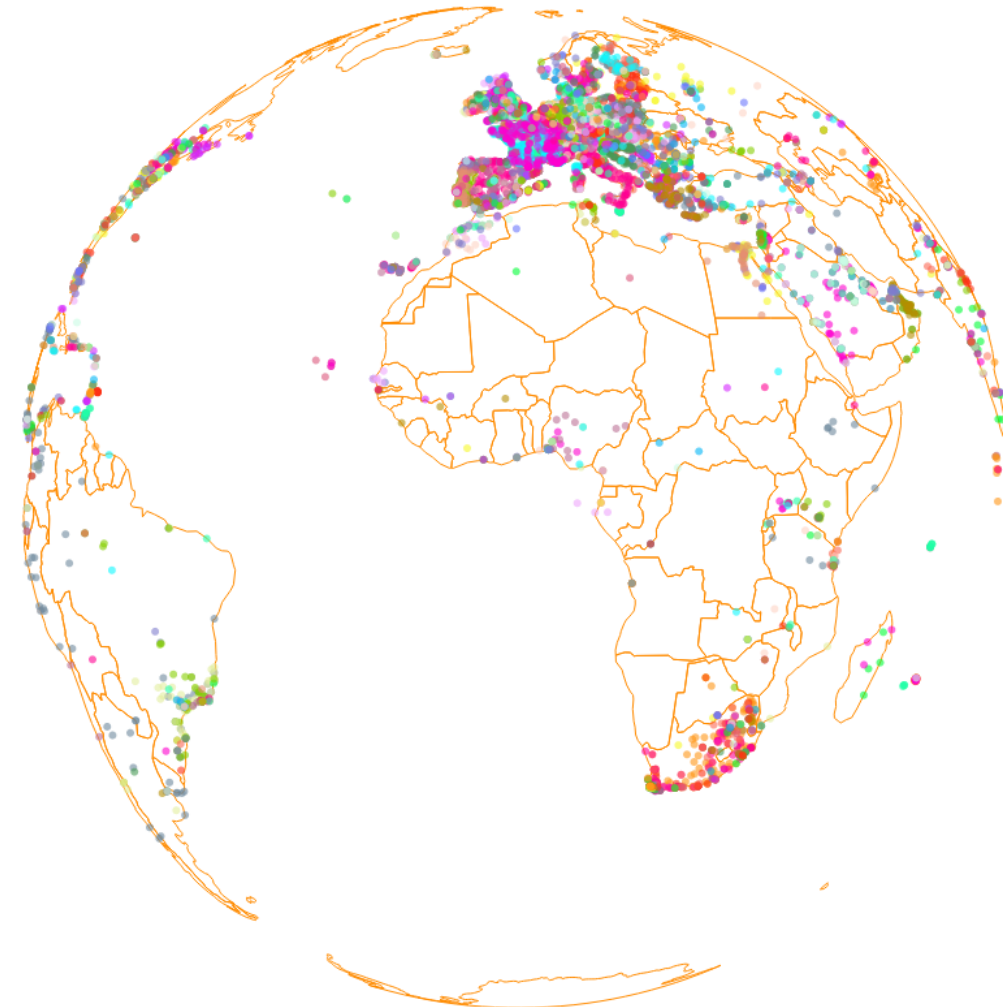
- ➡ From which locations do our clients access our services?
- ➡ Do they hide their real IP behind a proxy, a public VPN or a Tor relay?

## APPLICATIONS

- ➡ Customer insights
- ➡ Fraud detection

# PROJECT: GEOIP

SwissQuote Europe GEOIP Data



## IP2A\_as

- Axarfusion S.L.
- European Investment Bank
- SCARLET2 Scarlet
- CA Indosuez Wealth (Europe) S.A.
- Citelia s.a.
- EWE TEL GmbH
- Verizon Business
- African Network Information Center
- Netskope Inc
- British Telecommunications PLC
- The Constant Company LLC
- SKY UK Limited
- Fastweb SpA
- TalkTalk Communications Limited
- O2 Czech Republic A.S.
- Free SAS
- Telefonica de Espana S.A.U.
- Orange S.A.
- KPN B.V.
- PJSC Rostelecom
- Forcepoint Cloud Ltd
- Turk Telekomunikasyon Anonim Sirketi
- Polkomtel Sp. z o.o.
- Telefonica Germany GmbH & Co.OHG
- Bharti Airtel Ltd.
- Bharti Airtel Ltd. Telemedia Services
- Qinghai Telecom
- Triple T Broadband Public Company Limited
- Mobile Business Group
- Level 30 Tower 1
- China Mobile Communications Group Co. Ltd.
- China Mobile Communications Corporation
- SK Telecom
- ViewQwest Sdn. Bhd.
- Realmove Company Limited
- VNPT Corp
- PT. Net2Cyber Indonesia
- SPARKNZ Spark New Zealand Trading Ltd.
- Pacnet Business Solutions Ltd

# PROJECT: CRYPTO

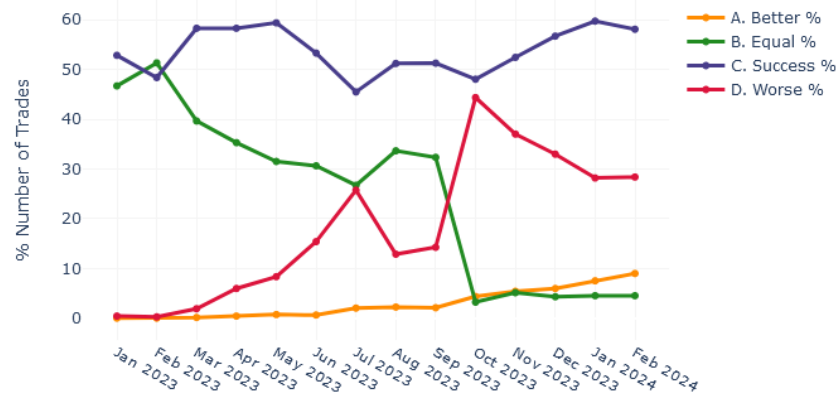
- ➡ Gain visual insights on the performance of different crypto exchanges, including our own SQEX
- ➡ Identify issues and opportunities

Dashboard URL:

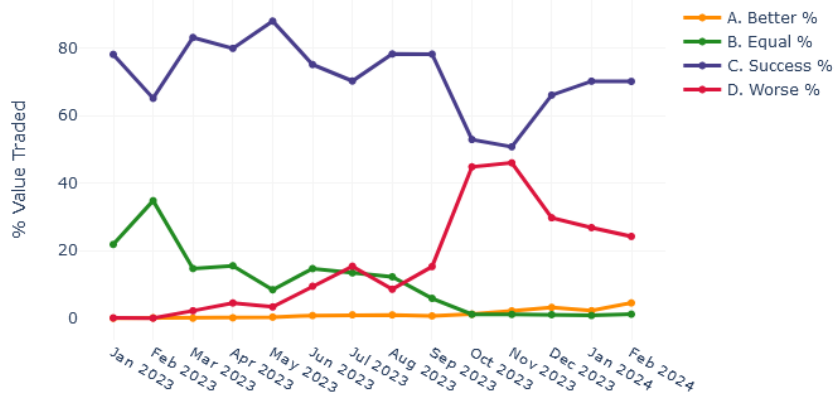
<http://sedna.bank.swissquote.lu:8051/>

# PROJECT: CRYPTO

% Number of Trades



% Value Traded



## MONTHLY PERFORMANCE

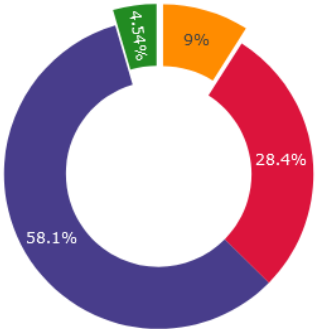
Month Selection

Feb 2024

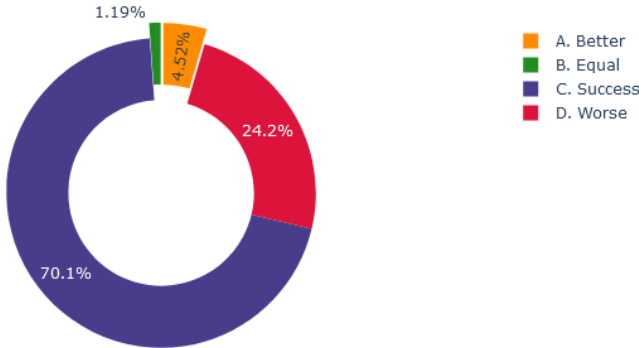
Performance Summary — Feb 2024

Status	% Trades	Trades	% Value	Value €
A. Better	9.004	349	4.518	1,000,775.74
B. Equal	4.541	176	1.188	263,216.98
C. Success	58.075	2,251	70.084	15,525,584.74
D. Worse	28.38	1,100	24.21	5,363,108.29

% Number of Trades — Feb 2024



% Value Traded — Feb 2024



# PROJECT: EXCHANGE

➡ Explore stocks hierarchically by country, exchange and index

Dashboard URL:

<http://bai01lu.bank.swissquote.lu:5678/>



# PROJECT: EXCHANGE

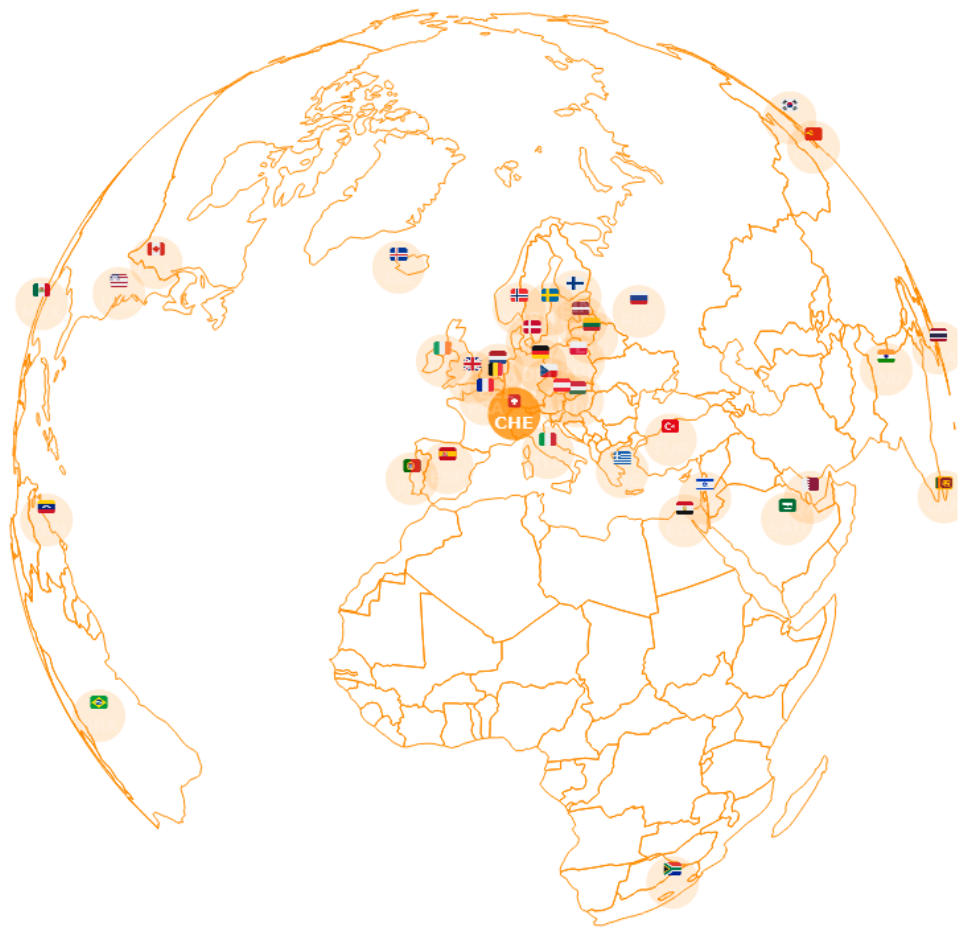
## HIERARCHICAL STOCK OVERVIEW

Home

Stock By Exchange

Stock By Index

EXPLORE LISTED COMPANIES BY EXCHANGE



Swissquote Group Holding Ltd



# SELECTED PROJECTS

## DATA MODELLING

➔ Credit Risk

➔ AML Risk

# PROJECT: RISK MODELLING

- ➡ We currently use rule-of-thumb (RoT) models for AML and credit risk
- ➡ We use the RoT risk scores as ground truth and build machine learning (ML) models on that basis
- ➡ The tool enable to alter country-related risks, weights and thresholds and visually understand the effects of such changes on the outcome of the RoT models.

NOTE: Due to a bug, first thing, one needs to click on UPDATE TABLE.

AML RISK modelling tool:

<http://sedna.bank.swissquote.lu:8055/>

CREDIT RISK modelling tool:

<http://sedna.bank.swissquote.lu:8052/>

# PROJECT: RISK MODELLING

## MATRIX CALIBRATION

Weights

EXPORT

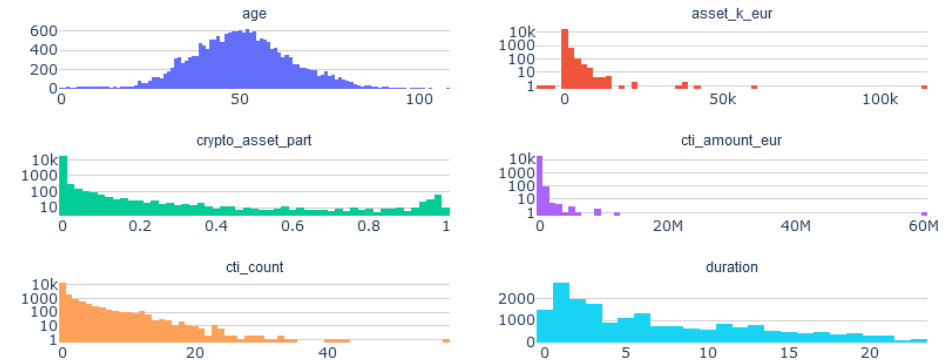
Feature	Weight	new_Weight
age_25	2	3
age_25_75	-2	-2
age_75	0	0
asset_k_eur_10	-5	-5
asset_k_eur_10_1000	0	0
asset_k_eur_1000_5000	3	3
asset_k_eur_5000_10000	5	5
asset_k_eur_10000	7	7
domiciliation_country_risk_Low	0	0
domiciliation_country_risk_Medium	3	3
domiciliation_country_risk_High	9	9
domiciliation_country_risk_Other_HRJ	35	35
domiciliation_country_risk_Blacklist	40	40
crypto_asset_part	5	5

Thresholds

EXPORT

Feature	Threshold	new_Threshold
age_25	25	25
age_75	75	75
asset_k_eur_10	10	10
asset_k_eur_1000	1000	1000
asset_k_eur_5000	5000	5000
asset_k_eur_10000	10000	10000
crypto_asset_part	0.8	0.8
cti_amount_eur	1000000	1000000
cti_count	100	100
duration_1	1	1
duration_2	2	2
duration_3	3	3
duration_4	4	4
duration_5	5	5

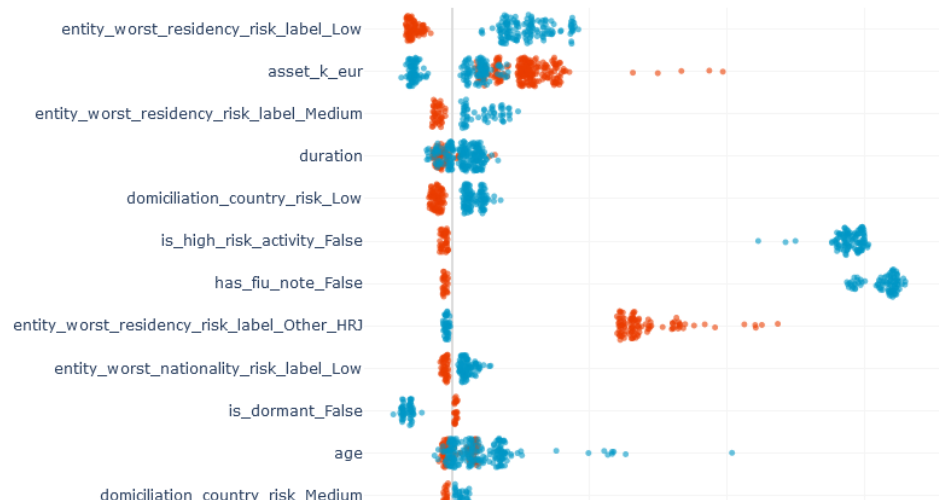
## DISTRIBUTIONS OF THRESHOLED FEATURES



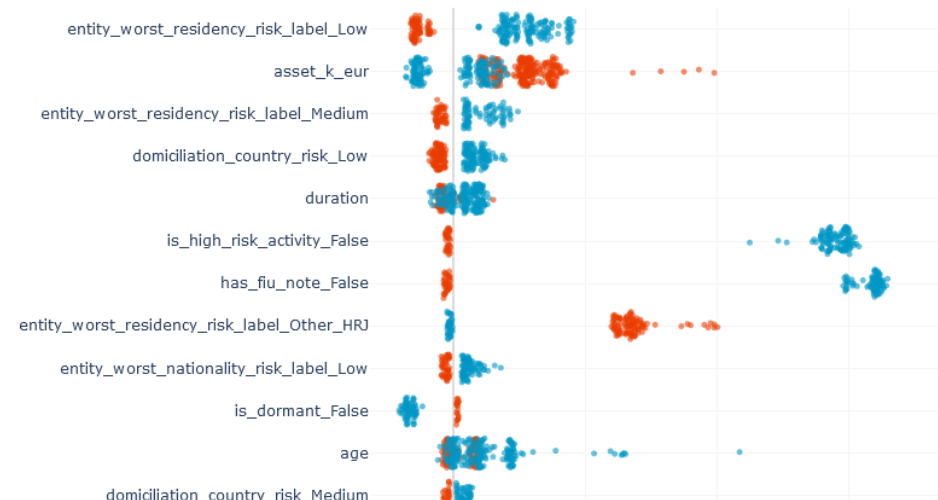
RESET MATRIX

CALCULATE

## ORIGINAL FEATURE IMPORTANCE



## NEW FEATURE IMPORTANCE



# SELECTED PROJECTS

## NATURAL LANGUAGE PROCESSING (NLP) AND GENERATIVE AI

- ➡ Question-Answer (QA) system and search engine (SQEagle)
- ➡ Automated background checks (Saint-or-Sinner)
- ➡ Diarisation of phone calls
- ➡ Automated parsing of e-mails

# PROJECT: SQUEAGLE

- ➡ Retrieval Augmented Generation (RAG)
- ➡ Thoroughly retrieves information from en.swissquote.lu (PDF and HTML)
- ➡ Answers questions exclusively on the basis of the provided context
- ➡ Provides excerpts and the links to the ranked sources
- ➡ It can be straightforwardly transformed into a chatbot just by adding conversational memory

AI system interface URL:

<http://bai01lu.bank.swissquote.lu:5000/>

# PROJECT: SQAgle



I find answers in en.swissquote.lu

Ask away

What is the difference between a Lombard loan and margin trading?

Clear

Submit

Answer

Though connected as both financing tools within investment contexts, Lombard loans and margin trading have some distinct characteristics. A Lombard loan (also known as a Swiss-style margin lending or pledged account lending) is a type of secured loan where an investor uses their existing securities as collateral, allowing them to invest further without selling their assets. It's more akin to a line of credit, and the loan amount depends on the value of the pledged assets.

On the other hand, margin trading (or simply margin) is a practice within securities trading where an investor borrows a portion of the funds needed to purchase or maintain a position in a security, with the securities themselves acting as collateral. The borrowed amount (margin) is a fraction of the total value of the position, and the investor only needs to pay the remaining portion (known as the maintenance margin). Margin trading thus involves a more direct link to a specific investment position, and the borrowed funds are used to increase the potential return (or loss) in a trade.

In summary, a Lombard loan is a broader, general-purpose credit facility, while margin trading is a specific practice within securities trading, both relying on the value of securities as collateral. However, it's important to note that the context here primarily discusses Lombard loans in a Swissquote setting, and the exact details and practices may vary across different financial institutions and jurisdictions.

## SOURCES

### Risks Disclosure Bank Europe En

Relevance Score: 0.73

<https://library.swissquote.com/shared-images/risks-disclosure-bank-europe-en>

This financing tool enables investors to take advantage of new market opportunities without depleting their portfolios. In other words, investors don't have to sell their securities to be able to invest in others. When stock markets show signs of high growth potential, a Lombard loan can expand your portfolio's range by enabling you to invest in new opportunities. It also offers investors the flexibility to use cash as needed without liquidating assets as long as they maintain sufficient level of equity in the account.

# PROJECT: SAINT OR SINNER

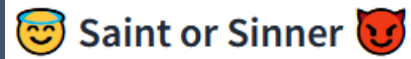
- ➡ Uses a webdriver to carry out a Google search with the designated keywords
- ➡ Visits every article from the search results
- ➡ Provides a summary, a reputational risk score and a justification for the score
- ➡ Creates a full report in PDF format
- ➡ The interface is for testing purposes only. Upon deployment, it will run in the background and generate automated alerts as required

AI system interface URL:

<http://bai01lu.bank.swissquote.lu:5666/>



# PROJECT: SAINT OR SINNER



## Background Checking and Reputational Risk Rating

Enter the name of the individual or organisation you want to carry out a background check on

Bernie Madoff

Enter the other keywords and/or logical operators as you would in Google and then click Submit

lawsuit OR corruption OR fraud

Number of search results

Between 1 and 30 (default: 10)

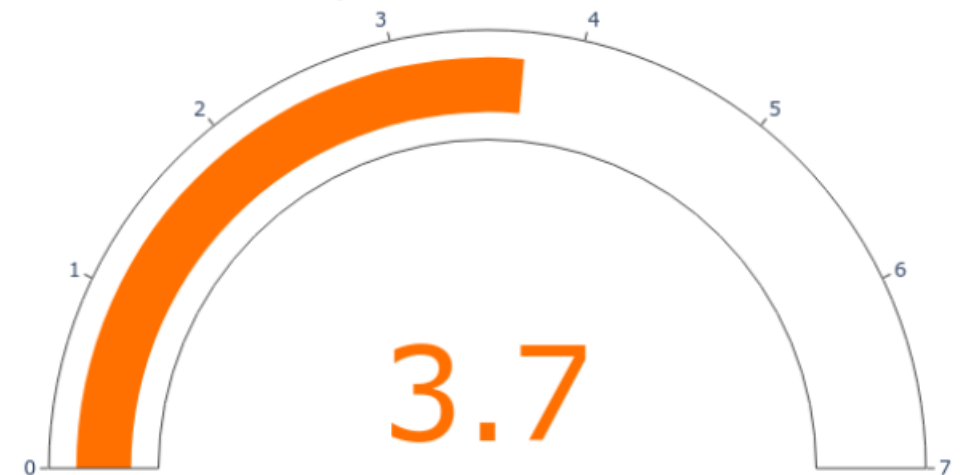
10

Clear

Submit

### Reputational Risk Rating

#### Reputational Risk Score



Download full report

Bernie\_Madoff\_lawsuit\_OR\_corruption\_OR\_fraud\_22\_03\_2024.pdf

446.4 KB

# PROJECT: SAINT OR SINNER

SOURCE 02

**Bernie Madoff is long gone. The lawyers are going strong**

[finance.yahoo.com](https://finance.yahoo.com)

ABSTRACT: The article by David Thomas, a Reuters-sourced writer, is a 4-5-minute long analysis of the after-effects of Bernie Madoff's Ponzi scheme, 15 years after his arrest and 2 years after his death. The scheme, one of the biggest in corporate fraud, is estimated to have cost his customers a hefty \$17.5 billion.

**SCORE: 5**

RATIONALE: 5

The information in the article poses a substantial reputational risk for Bernie Madoff, who is still the biggest name in corporate fraud, and the legal team overseeing the liquidation of his firm is still sifting through the after-fall of his Ponzi scheme. The case has been a windfall for the lawyers, and the fees they have been awarded are a substantial proportion of the firm's revenues.

SOURCE 03

**Madoff Victim Fund to Pay Out \$158.9M to Fraud Victims | Chief Investment Officer**

[ai-cio.com](https://ai-cio.com)

ABSTRACT: The Madoff Victim Fund has begun paying out \$158.9 million to 25,000 investors who lost money in Bernie Madoff's Ponzi scheme. It is the fund's ninth distribution, raising the total restitution to over \$4.22 billion. The fund, established by the Department of Justice in 2013, has now collected and distributed to nearly 41,000 investors more than 91% of their losses.

**SCORE: 5**

RATIONALE: 5: "The reputational risk for Bernie Madoff is substantial, as the Madoff Victim Fund has been paying out restitution to investors who lost money from the Ponzi scheme, and the total restitution has now exceeded \$4.22 billion.

SOURCE 04

**Latest Batch Of Payouts To 25,000 Victims Of Madoff Ponzi Scheme Total Almost \$160 Million**

[forbes.com](https://forbes.com)

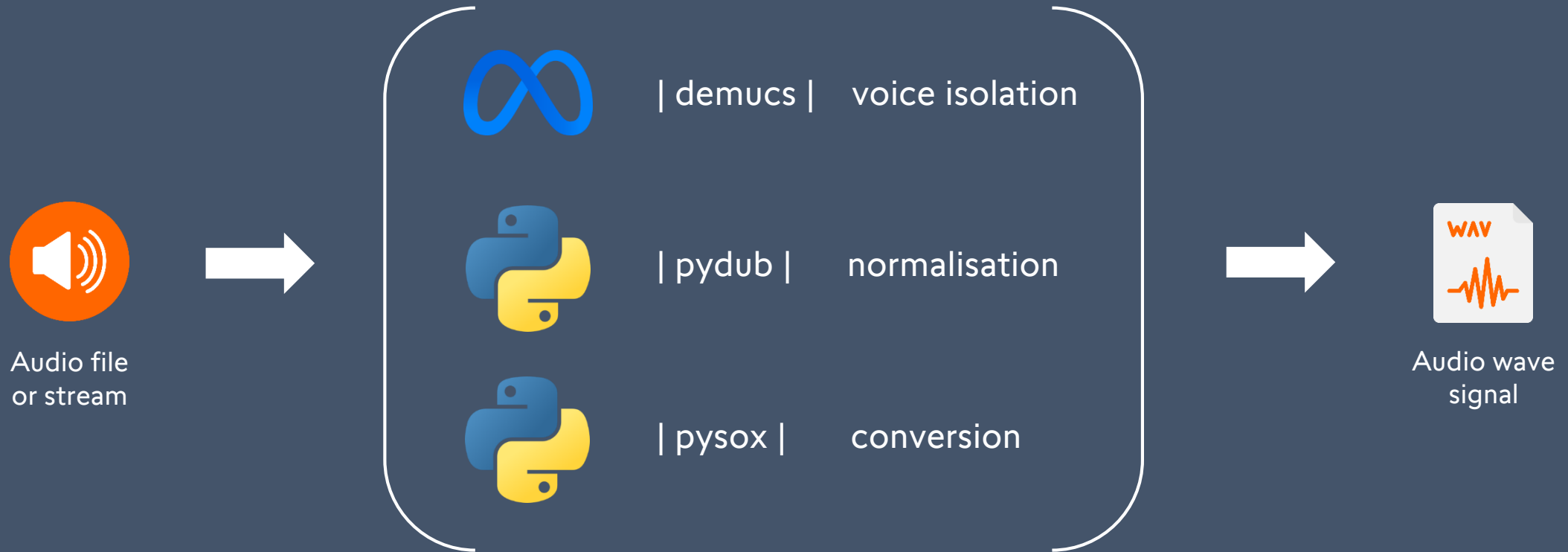
ABSTRACT: The Justice Department has now paid out a total of \$4.22 billion in compensation to 40,843 victims of the Bernie Madoff Ponzi scheme, with the ninth payout totaling close to \$160 million. The Madoff Victim Fund has recovered 91% of the total fraud losses, with funds collected from civil forfeitures, deferred prosecution, and civil and criminal civil forfeitures. The largest benefactors, Jeffry Picower and JPMorgan Chase Bank, provided a total of \$3.9 billion in funds.

# PROJECT: DIARISATION

Who said what, when?

- ➡ Transcription
- ➡ Alignment
- ➡ Speaker identification
- ➡ Analysis

# DIARISATION: AUDIO PREPROCESSING

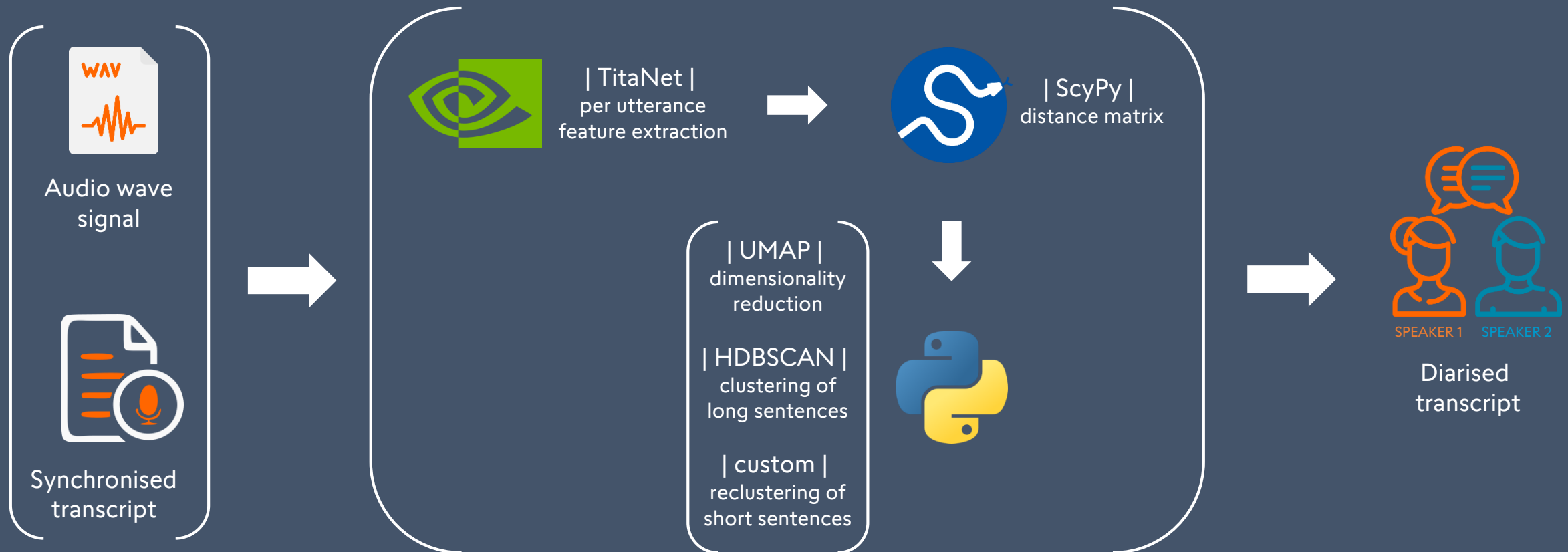


# DIARISATION: TRANSCRIPTION

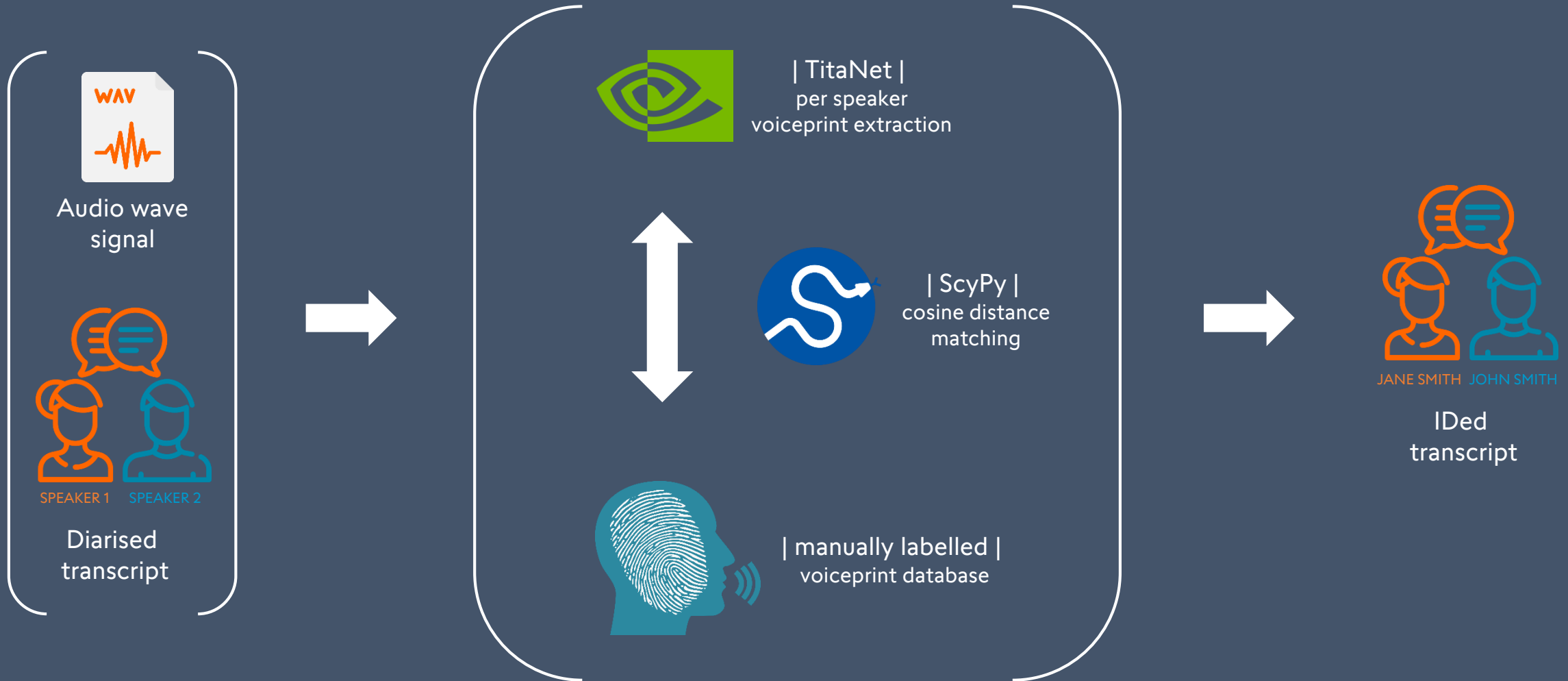


# DIARISATION

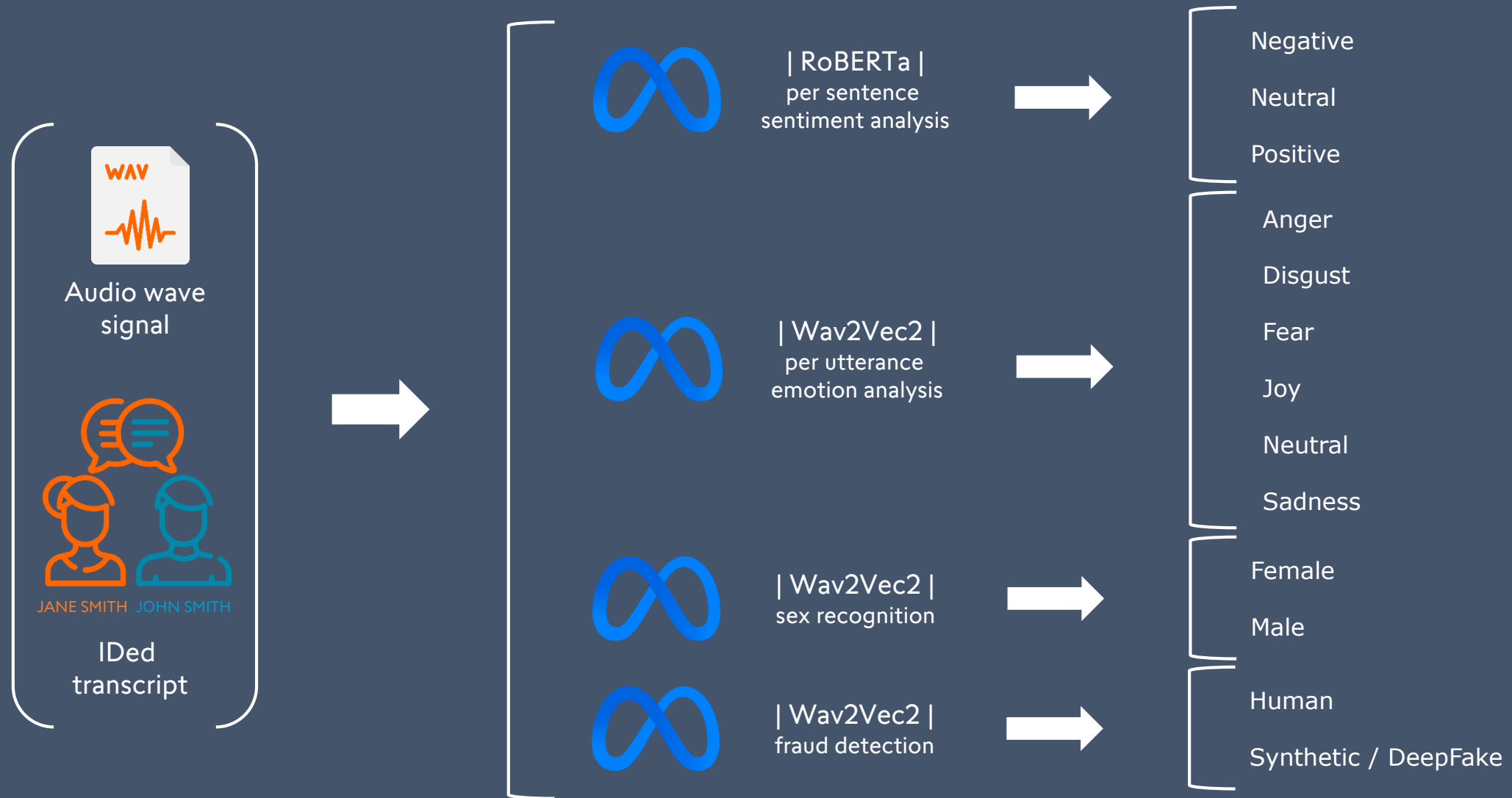
Who said what when?



# DIARISATION: SPEAKER IDENTIFICATION

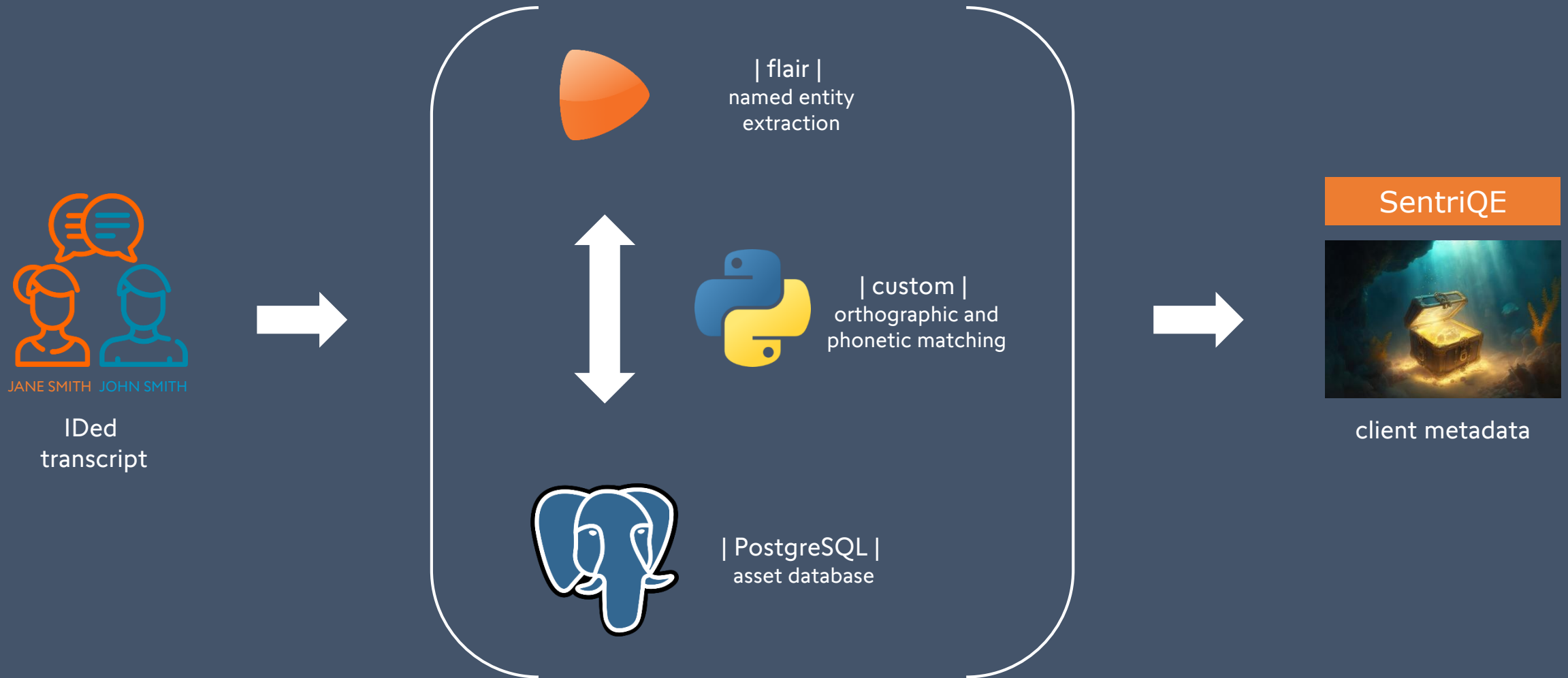


# DIARISATION: MISCELANEOUS ANALYSIS





# DIARISATION: NAMED ENTITY RECOGNITION (NER)



# PROJECT: E-MAIL PARSING

Similar functionalities as the diarisation pipeline, except those voice-related, plus:

- ➞ Multilingual support
- ➞ Extraction of the body of the most recent message
- ➞ Thread summarisation
- ➞ Translation

# MISCELLANEOUS TOOLS

## ➞ SQE YT Viewer

Provides access to Swissquote Youtube channels

<http://bai01lu.bank.swissquote.lu:5555/>

## ➞ Apple2PC

Converts exotic Apple formats into more conventional ones

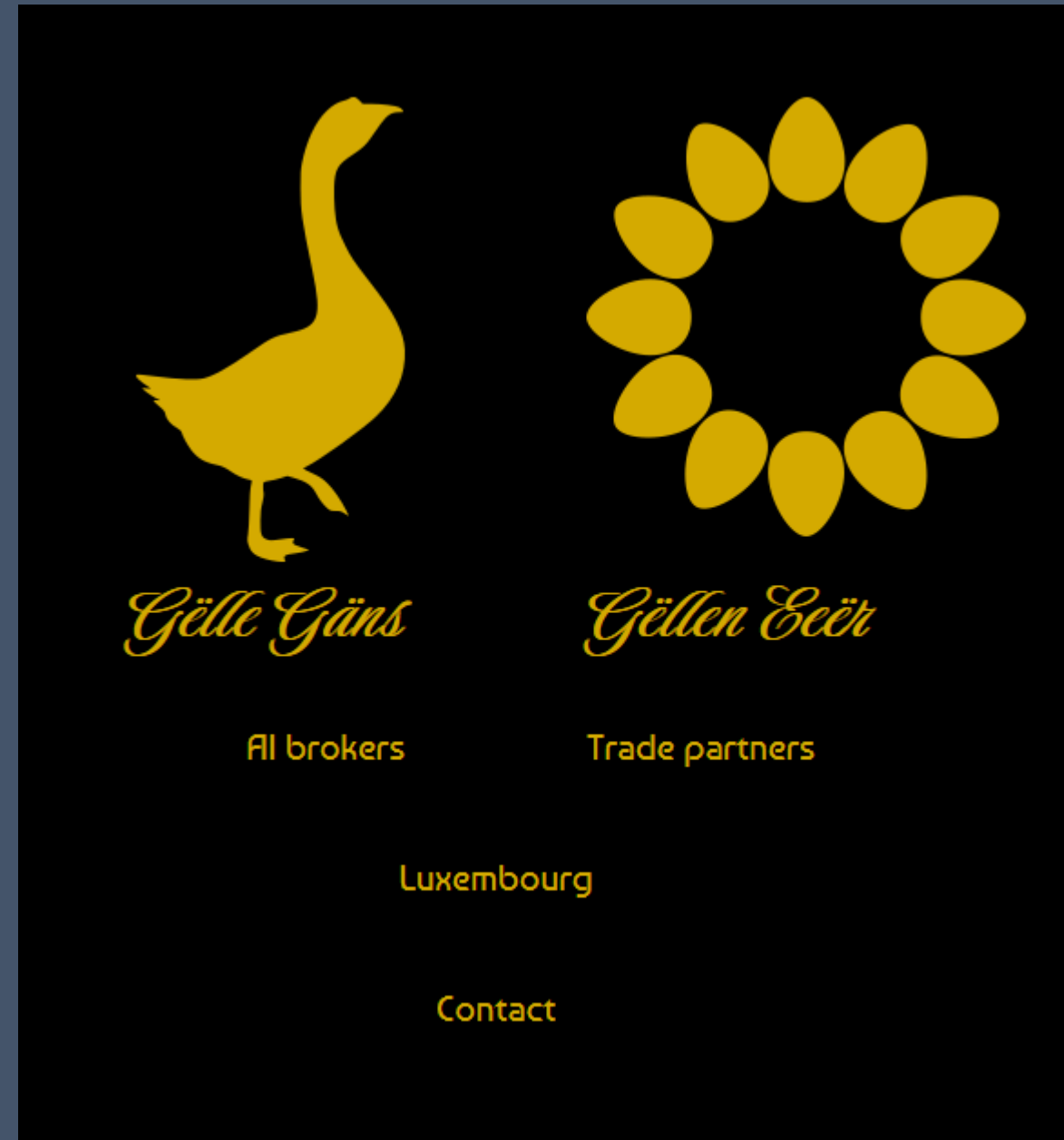
<http://bai01lu.bank.swissquote.lu:5777/>

# AI AS A HOBBIE

## Broker Automaton

- ➡ The future of mainstream trading?
- ➡ Developed at home in my free time
- ➡ AI-powered automated trading agent
- ➡ Pluggable to any trading platform that exposes its API
- ➡ Generates passive income unattended
- ➡ Requires zero finance/trading knowledge
- ➡ The goose thing is obviously a joke (for the moment 🤪)

<https://freeletz.lu/freeletz/goose/golden.html>



I am certainly forgetting something, but you get the idea...