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Challenges of KYC processes: A journey from screening a client to assessing its underlying network

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Agenda

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- Introduction
- KYC and Network-based approaches
- Challenges in screening global clients with Network-based KYC
- Building networks and data linkage
- How can Artificial Intelligence help?
- Q&A

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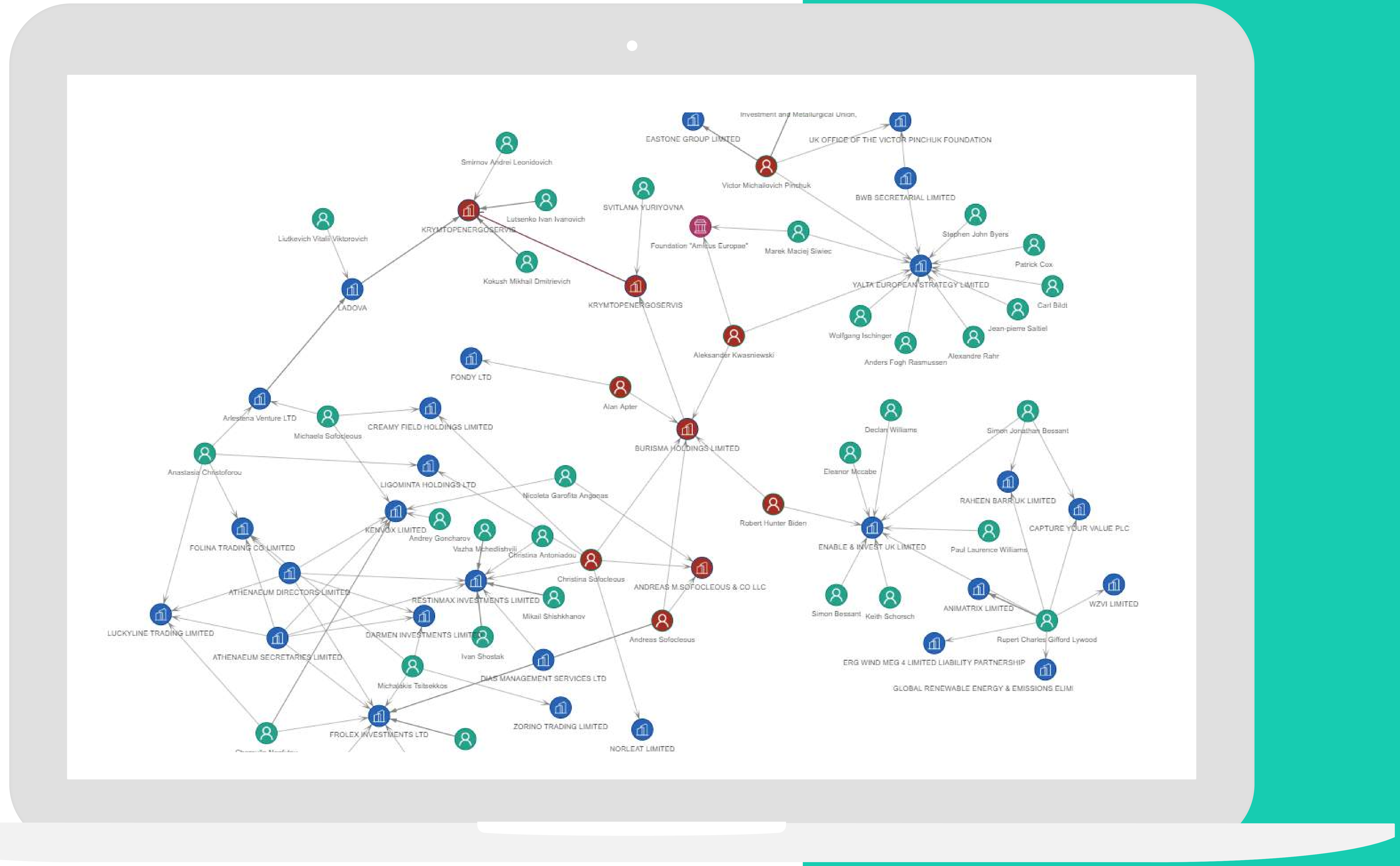

Introduction

Introduction

- Qualifying financial crime risk is becoming overly complex.
- Financial institutions are not able to discriminate “good” and “bad” clients.
- Current frameworks generate a high number of “false positives” and “false negatives”.

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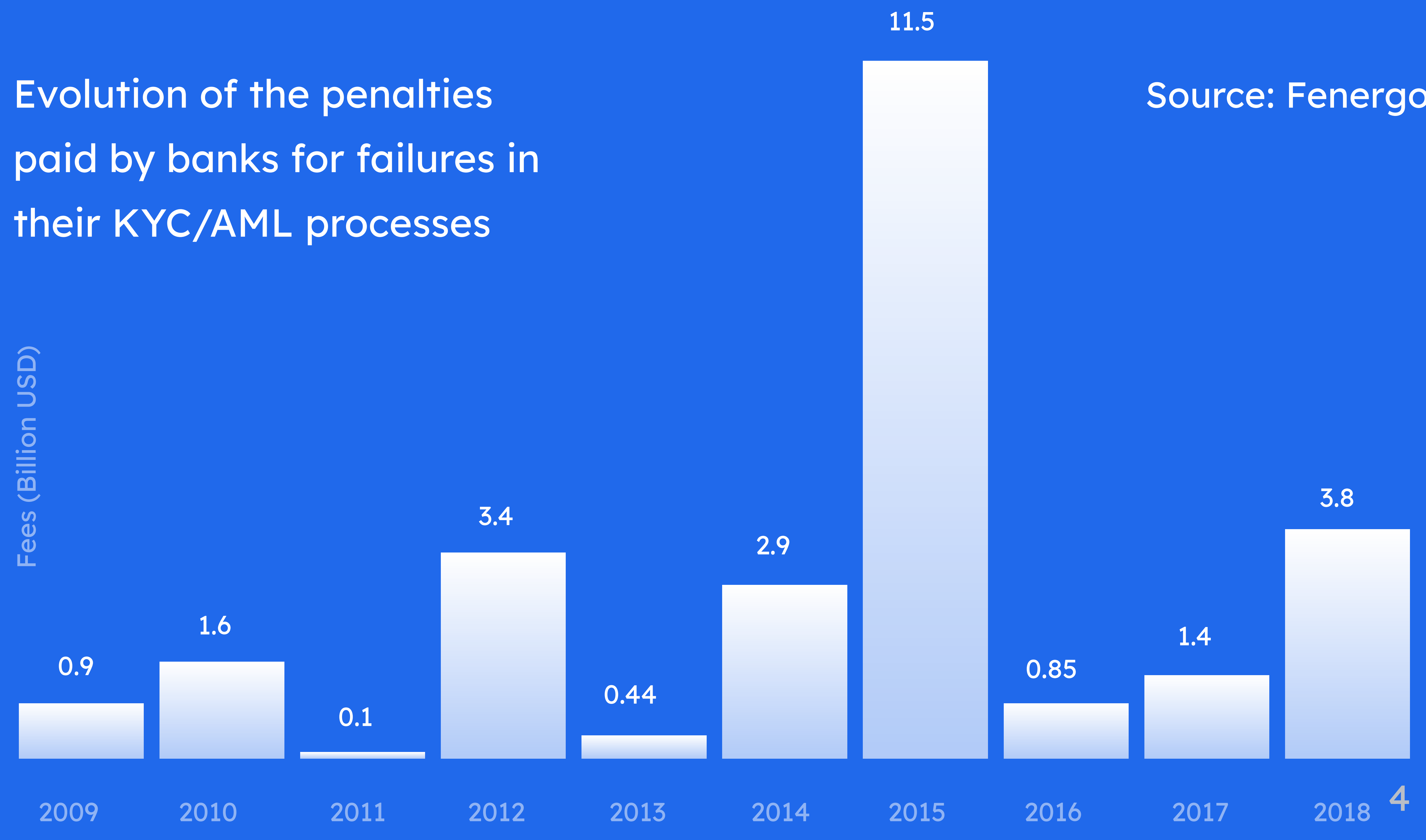
Institutions face a double-edged dilemma:
- Miss profits by being overly conservative or
- Pay penalties for being too aggressive

Evolution of the penalties paid by banks for failures in their KYC/AML processes

Source: Fenergo



What are the key components of KYC?

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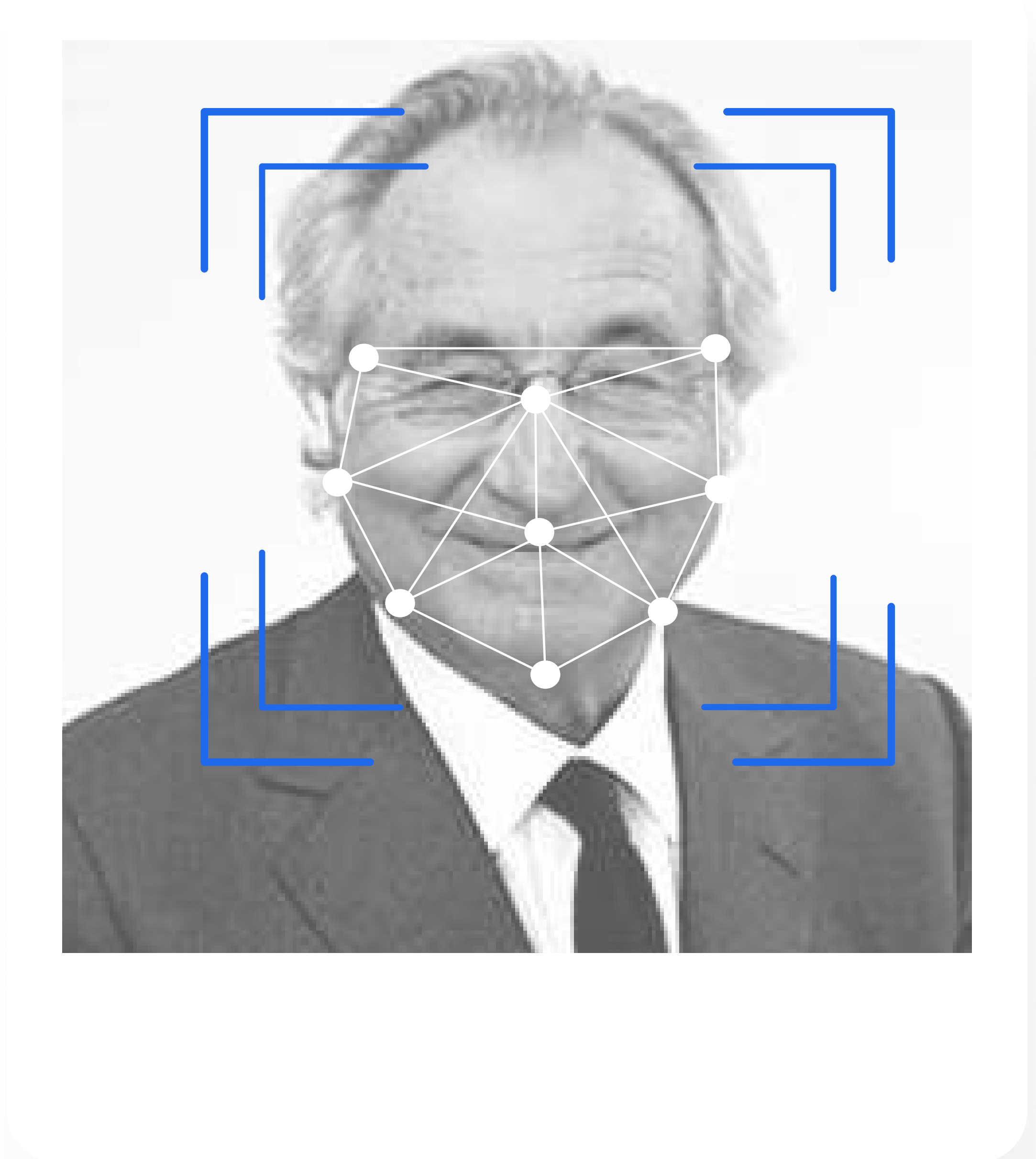
Initial screening



Indentity verification

Client discovery process

Basic checks

Enhanced due-dilligence

Monitoring

Periodic checks

Customer activity

Client discovery process

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- Convicted felons
- Ultimate Beneficial Owners
- Disqualifications
- Charges
- Insolvencies
- Sanctions
- Politically Exposed Persons
- Adverse media

Are there "events" in the client's past?

Is the identified client undesirable?

Does the client bear a high risk?

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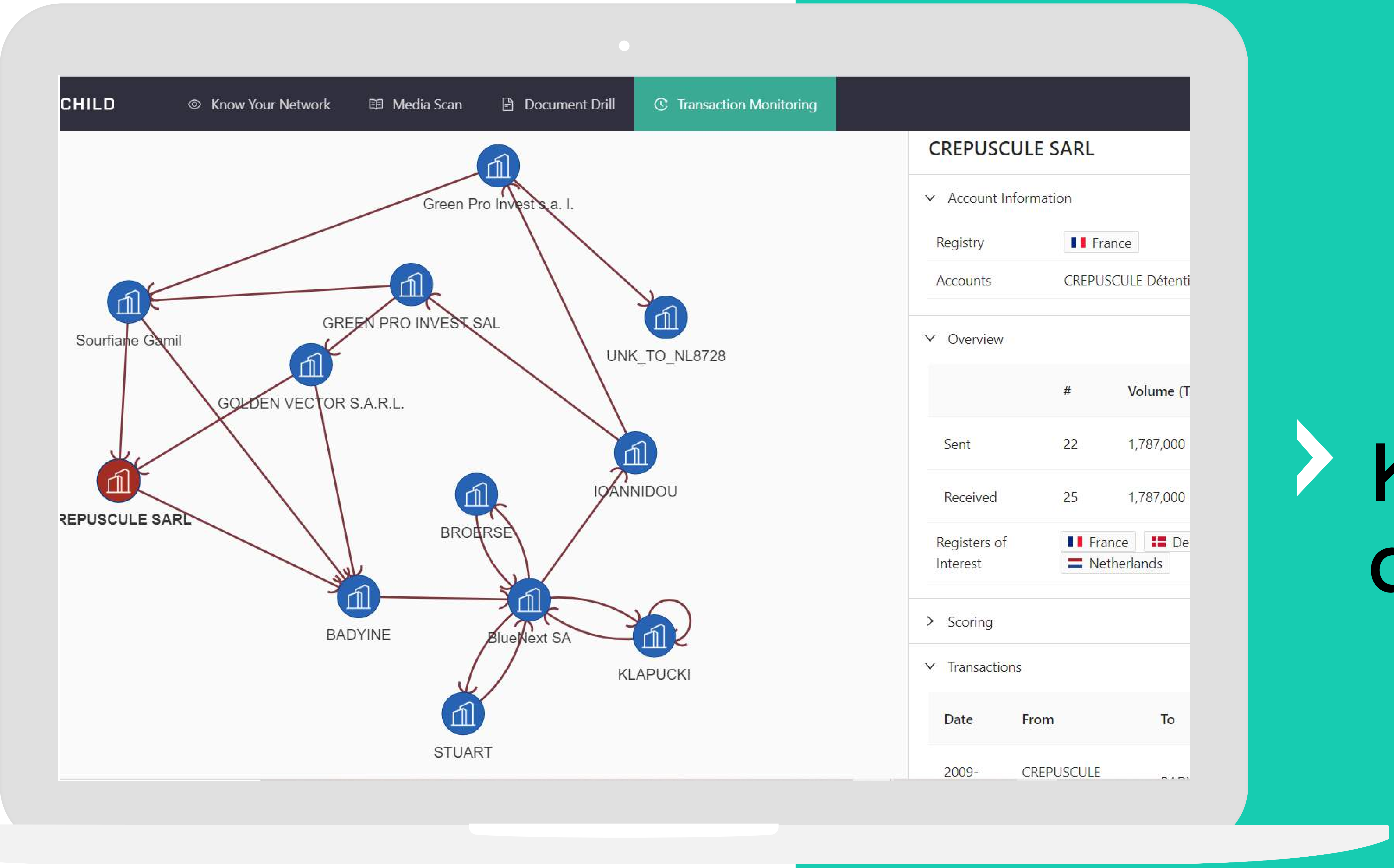

KYC and Network-based approaches

KYC and Network based approaches

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- Assessing the fully-fledged picture of a client is a crucial aspect of the client discovery process.
- A plain standalone client screening does not fully reflect the level of financial crime risk.
- There is never only one person or one company behind a financial crime scheme, but an organised network of firms and individuals.
- The basic KYC as a concept is not efficient, generates a high number of "false positives" and "false negatives" and cannot assess criminal networks.
- A client can come as low risk through a plain screening. This process would not indicate whether the previous director of the client's company is disqualified from another jurisdiction or has an investor who is related to a sanctioned individual.

Case study: Oleg Deripaska

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Case study: Fincen Leaks/ICIJ/Sanctions

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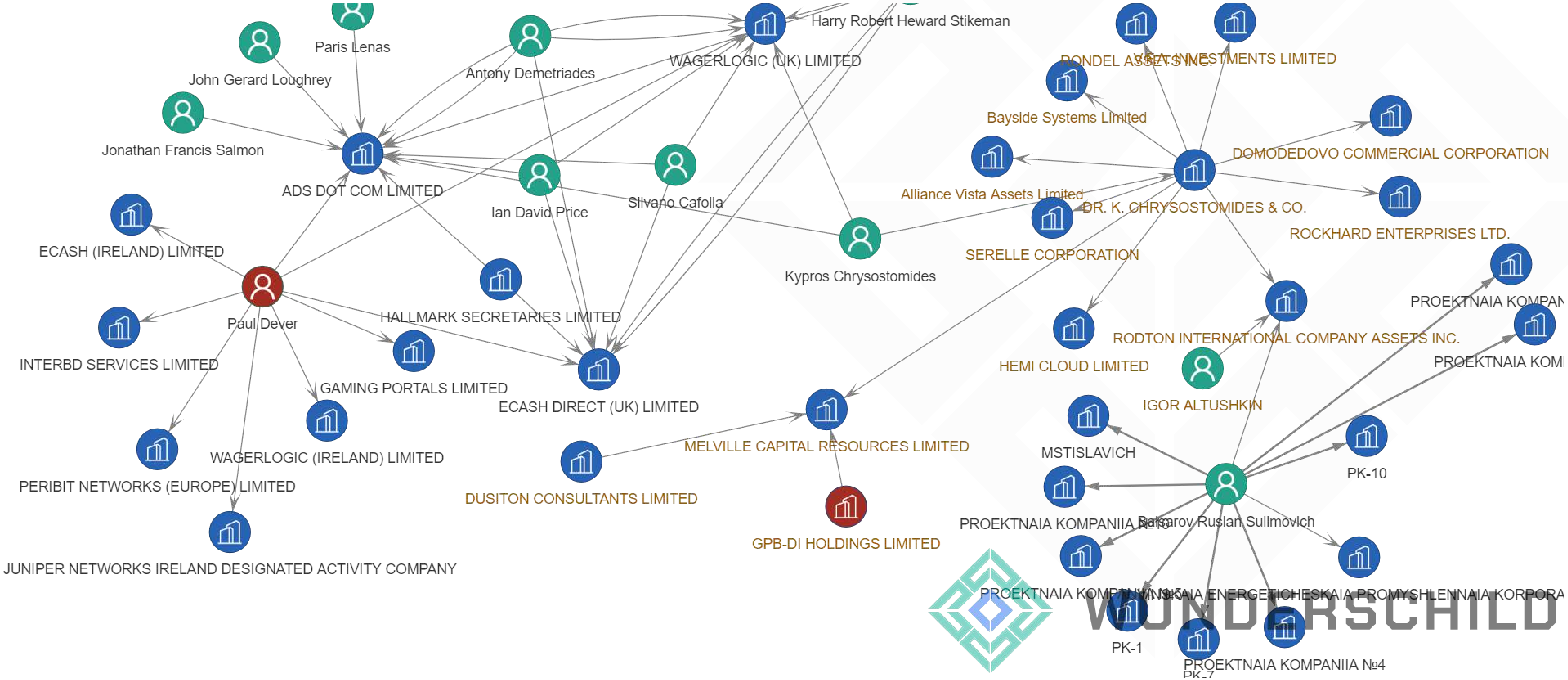

KYC and Network based approaches

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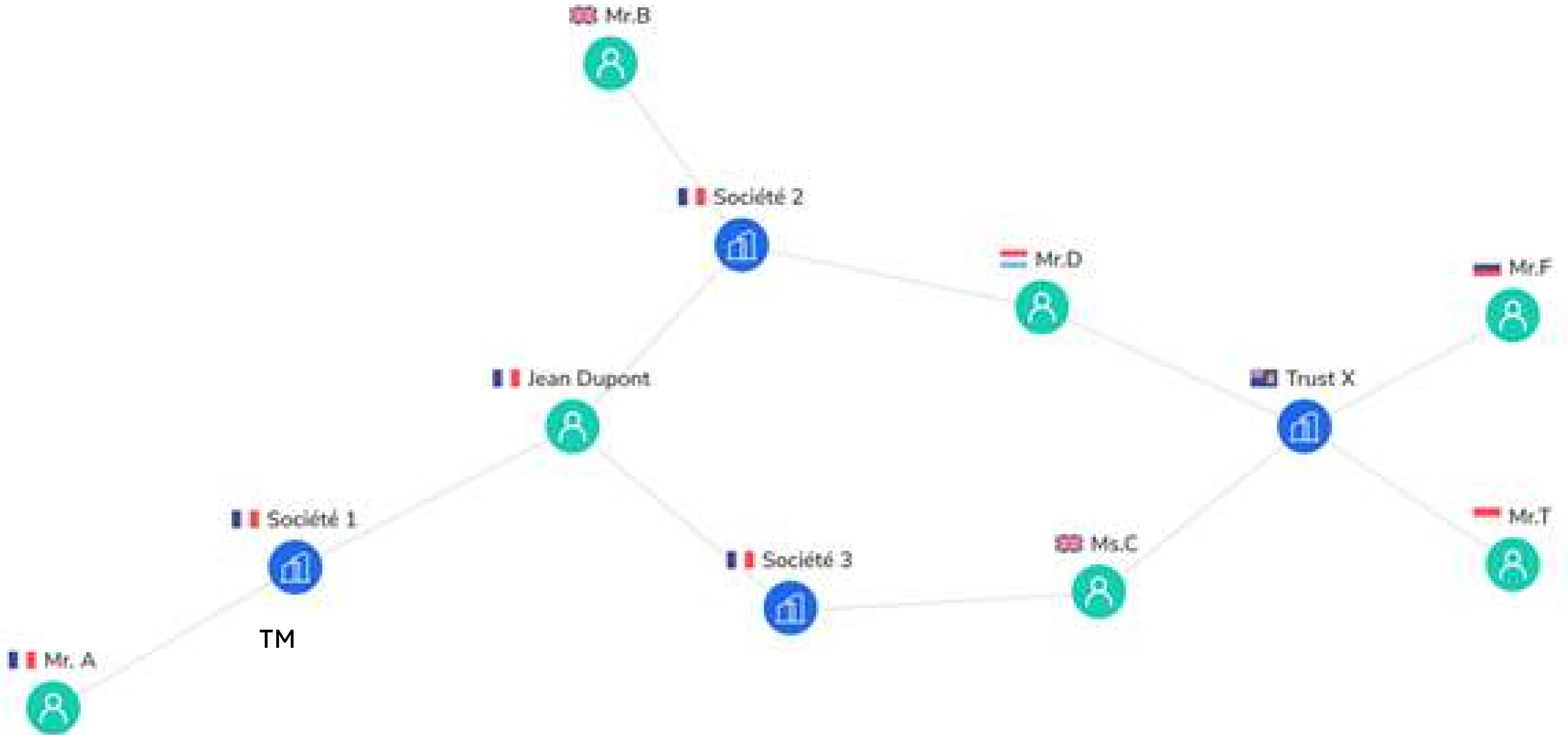
Know Your Client's Network

A paradigm shift from KYC



Network-based approaches new generation of compliance tools

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Knowing Your Client

- Backwards-looking
- Standalone approach
- A high number of false-positive/negative
- Siloed approach
- Passive

Knowing Your Client's Network

- Forward-looking
- Focus on clients' connections
- Optimised performance
- Integrated approach
- Proactive

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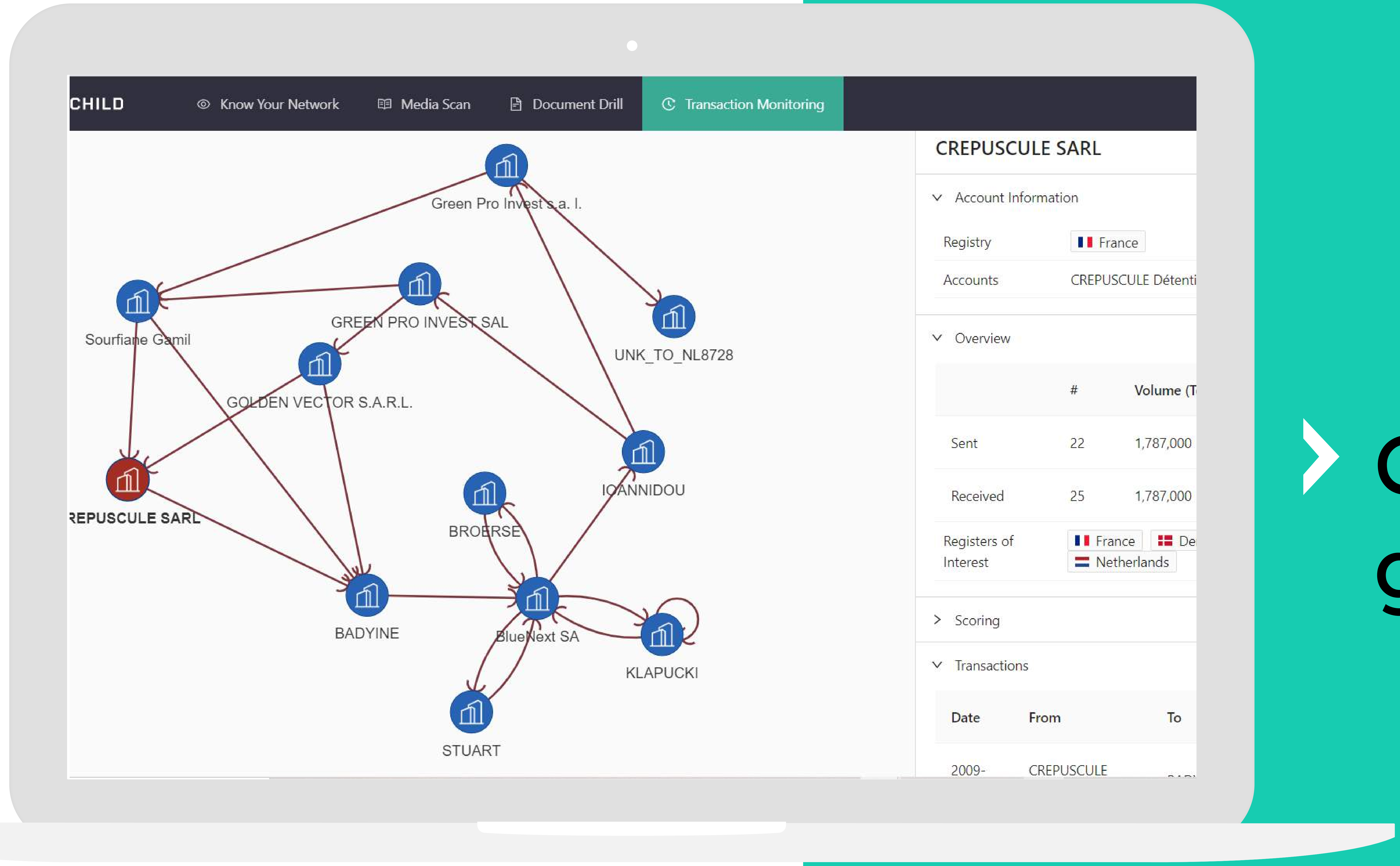

Challenges in screening global clients

Challenges in screening global clients

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- 5 AML Directive requires more transparency on Ultimate Beneficial Ownerships by setting up publicly available registers for companies, trusts and other legal arrangements.
- The network-based assessment becomes complex when the client resides and owns assets in two or more countries.
- The compliance officer needs to find all the records for such clients in different databases and registries.
- When dealing with clients having data recorded in different languages and with different alphabets, the simple name matching methods have severe limitations.

Screening global clients: data linkage

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1. How to match two records with names in the same langauge?

2. How to match two records with names in different languages using the same alphabet?

3. How to match two records with names in different languages using different alphabets?

4. How to much two records of a person with a very frequent name?

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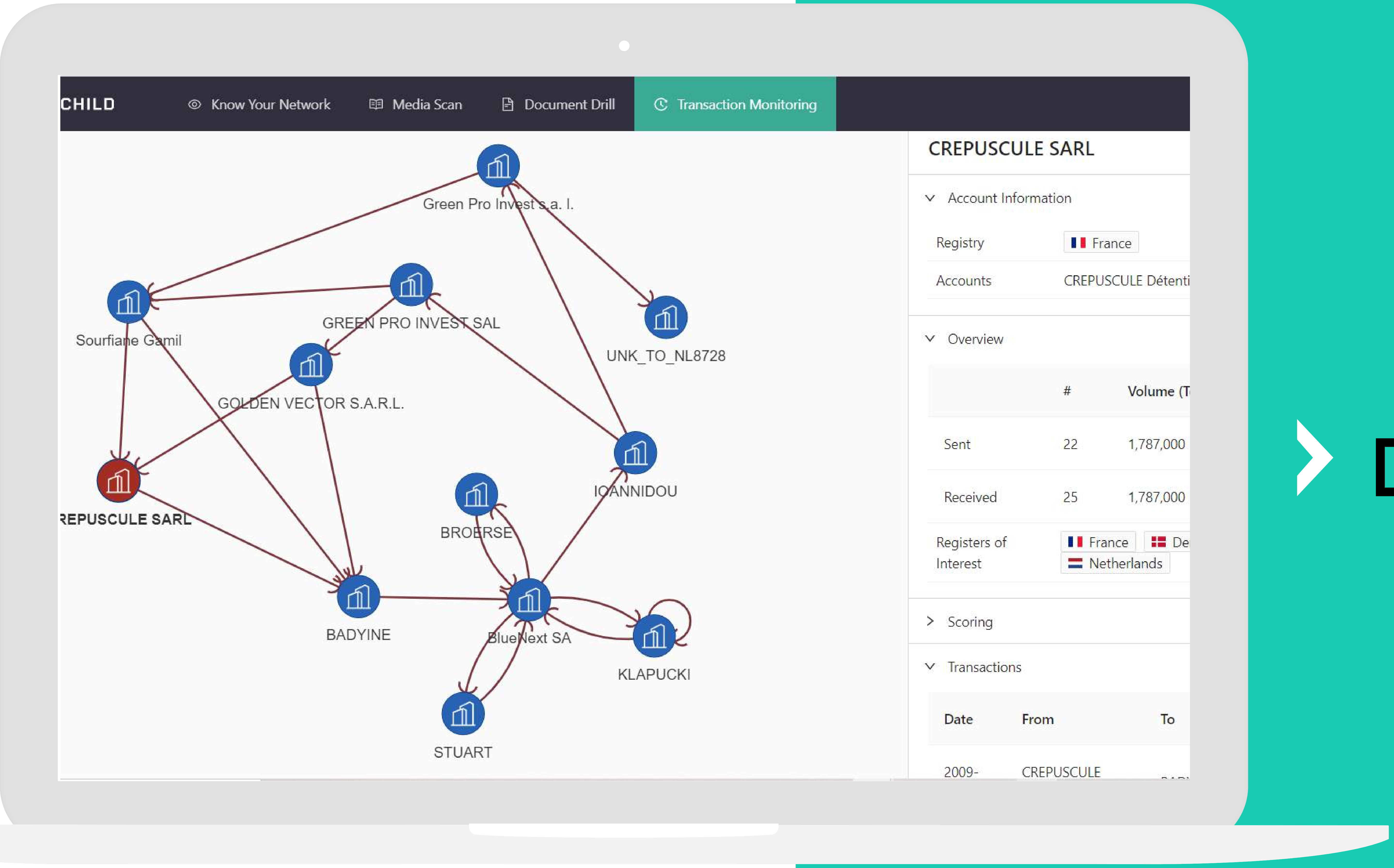

Data linkage

Data linkage

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Data linkage is the process of finding records in one or a few datasets that refer to the same person or entity.

Data linkage is necessary when joining datasets based on entities that may or may not share a common identifier.

The differences in data shape, language or format require advanced algorithms.

- ✓ *Deterministic data linkage*: Links records by name and date of birth
- ✓ *Probabilistic data linkage*: Matched only parts of the names/ translate in various languages
- ✓ *Machine Learning data linkage*: Inferes relation-based rules from data

Data linkage

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The most common strategies for data linkage are:

- **Name matching**, consisting of simple entity name matching (*Deterministic*)
- **Name + Personal Info (PI) matching**, consisting of entity name matching and matching of entity related information (Address, Gender, Date of Birth) (*Deterministic/Probabilistic*)
- **Names + Personal Info (PI) + Relational Info (RI)** (ie. connected entities) matching, consisting in name matching, matching of entity-related information and matching of connected entities names (*Probabilistic/Machine learning*)

Multilingual name matching

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Name transliteration in different languages:

↓

Risks

Hide past events

Create synthetic identities

English: Mustafin Ilgiz Aivarovich

Russian: Мустафин Ильгиз Айварович

French: Moustafine Ilguiz Aïvarovitch

German: Musstafin Ilgis Aiwarowitsch

Hebrew: ' מוסטפין אילגיז אייברוביץ

Multilingual name matching

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- Similarity functions are left undefined for the cases where names are represented as one string, and it is unknown how to separate names into parts (first name, last name, etc.).
- Jaro-Winkler and Levenshtein distances give maximum distances for strings written in two different alphabets (e.g. Latin and Cyrillic). This also limits the applicability of the approach in multi-lingual context, and increase the dependency on the transliteration model used.
- The solution is to convert name strings to some common phonetic representation of the names and then to compare the phonetic representations. Some of the possible phonetic representations are Soundex, Match Rating Approach, Daitch-Mokotoff Soundex, Beider-Morse Phonetic Matching, Double Metaphone.
- After the names are converted to their phonetic representations, the two strings can be compared using a similarity metric.

Case Study: French - Russian

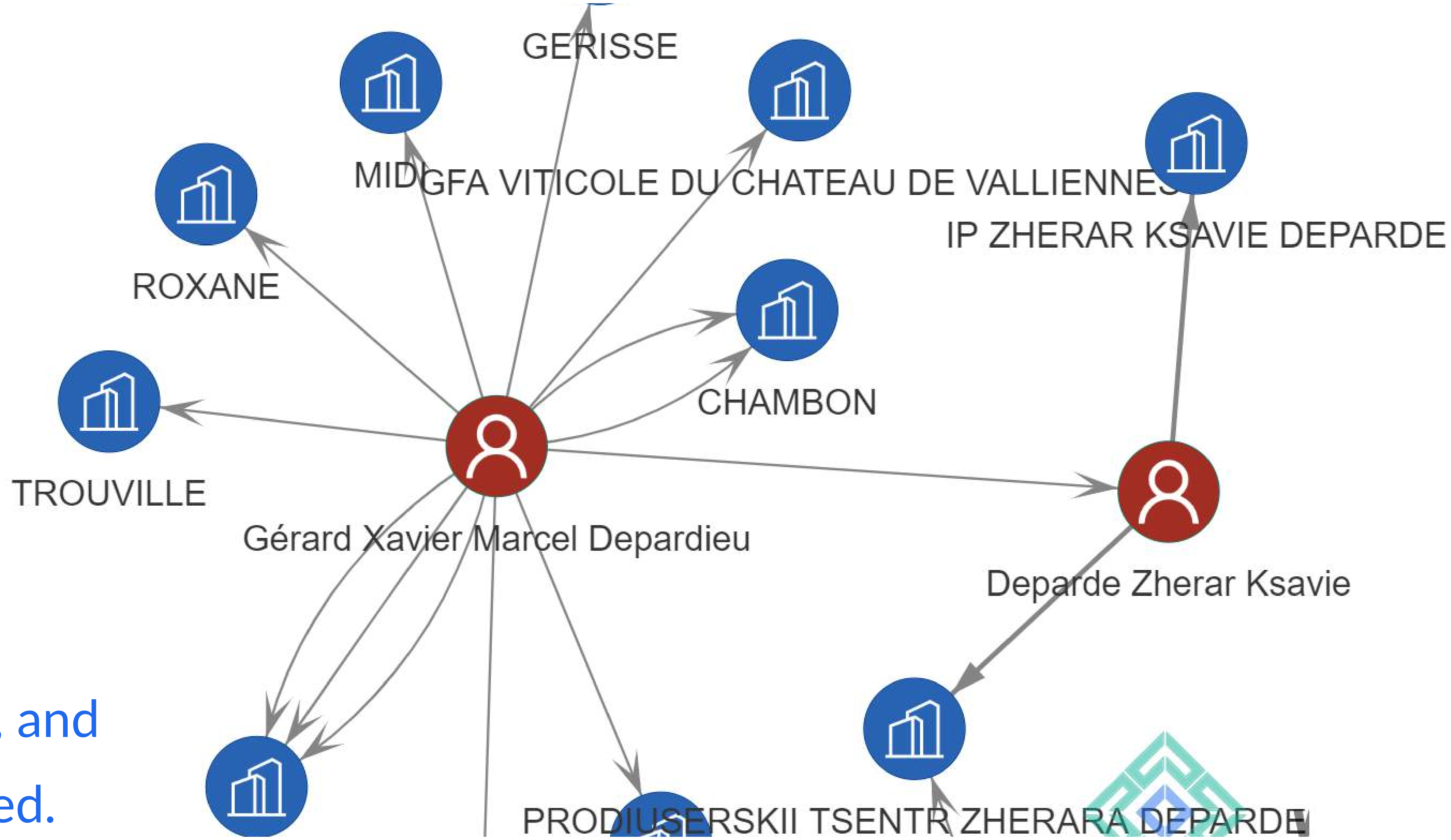
French: Gérard Xavier Depardieu

Russian: Жерар Депардьё / Жера́р Ксавье́ Депардьё

English: Zherar Ksavie Deparde

The two versions of the name are hugely different, and in fact, in such a situation another identity is created.

Transliteration is a real weapon facilitating the creation of multiple identities



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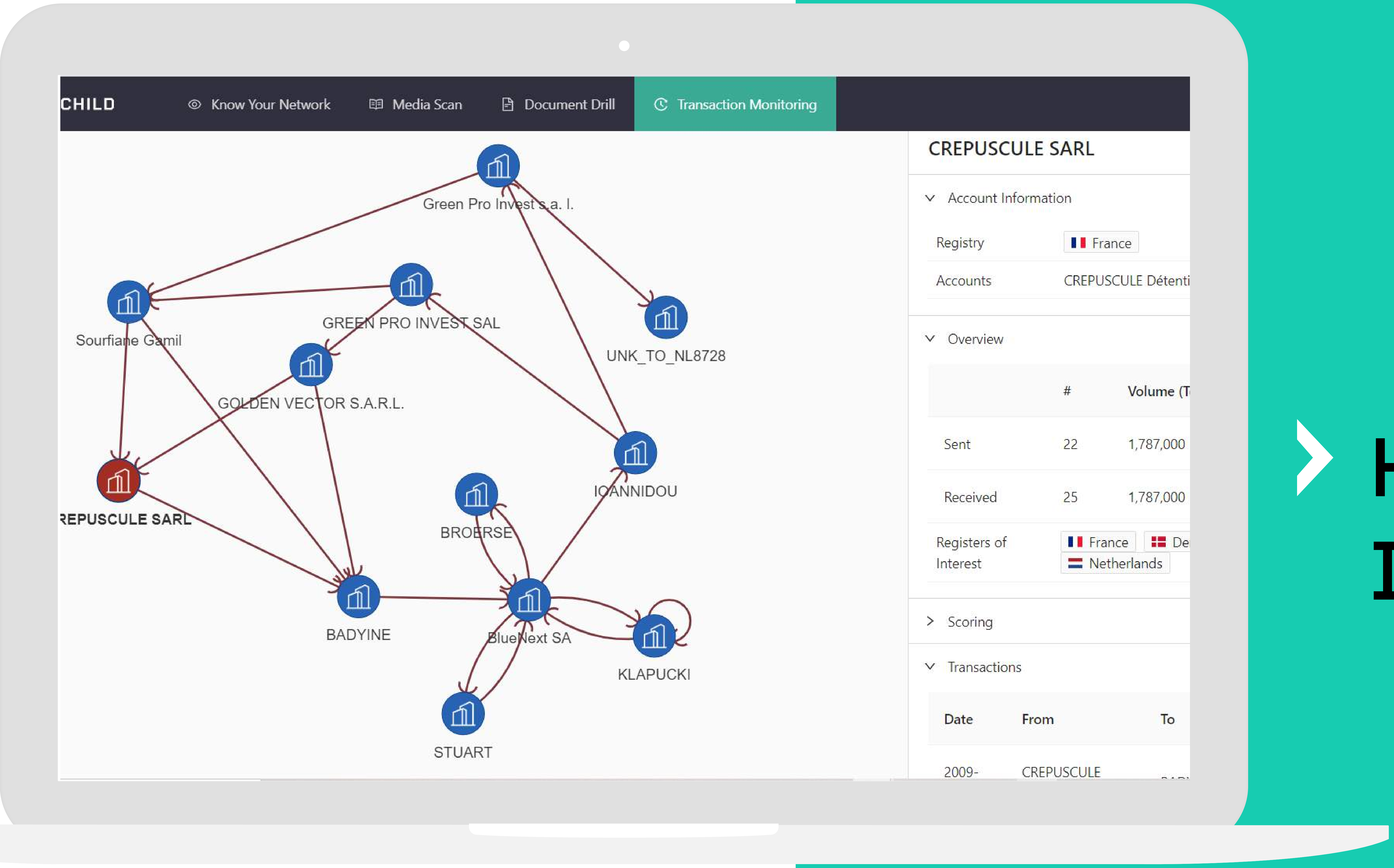

How can Artificial Intelligence help?

What does AI mean?

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Artificial intelligence (AI) refers to a set of methods and systems aiming to simulate human intelligence. AI is implemented in machines that are programmed to think like humans and mimic their actions. In compliance, the use of AI encompasses three levels of complexity:

1. Automation of repetitive manual task (i.e. search, box-ticking processes)
2. Emulation of human logical reasoning (i.e. replication of rule-based actions, implementation of syllogisms)
3. Origination of new rules and reasonings based on data exploration with machine learning techniques

How can Artificial Intelligence help?

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- Automate simple name matching process, when names are in the same language (Level 1).
- Automate data linkage based on name matching and DOB (Level 1).
- Execute relational-attribute based matching approaches. AI systems can explore the client's connections and match based on common relationships (Level 2).
- Execute relational-attribute based matching approaches using data from Adverse media. Named Entity Recognition (NER) techniques can help to enforce matches (Level 2).
- Assess the risk of a client using information driven for clients's network (Level 3).
- Integrate screening and transaction monitoring (Level 3).

What are the technologies available for Network-based KYC?

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	Popularity	Speed	Scalability	Data management	AI
neo4j	★★★★	★★★	★★★	★★★	★★★
Amazon Neptune	★★	★★★	★★★	★★★	★★★★
TigerGraph	★★	★★★★	★★★★	★★★★	★★
OrientDB	★★★	★★	★★★	★★★	★
ArangoDB	★★★	★★★	★★★	★★★	★★

What are the challenges?

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★ **Implementation:** Deploying AI systems to enhance compliance functions is a long and intense process.

★ **Legacy systems:** AI works better when data repositories are mapped and standardised. Legacy data warehouses require, in most cases, massive re-engineering to serve efficiently AI.

★ **Scalability**: AI may work well when applied to the regional compliance function, but maybe sub-optimal in terms of speed and performance when deployed to bigger scale (i.e. screening hundreds of thousand vs hundred of million clients).

★ **Cost:** Implementing AI in global financial institutions incurs high expenses and impact budgets over several years.

How can Artificial Intelligence help?

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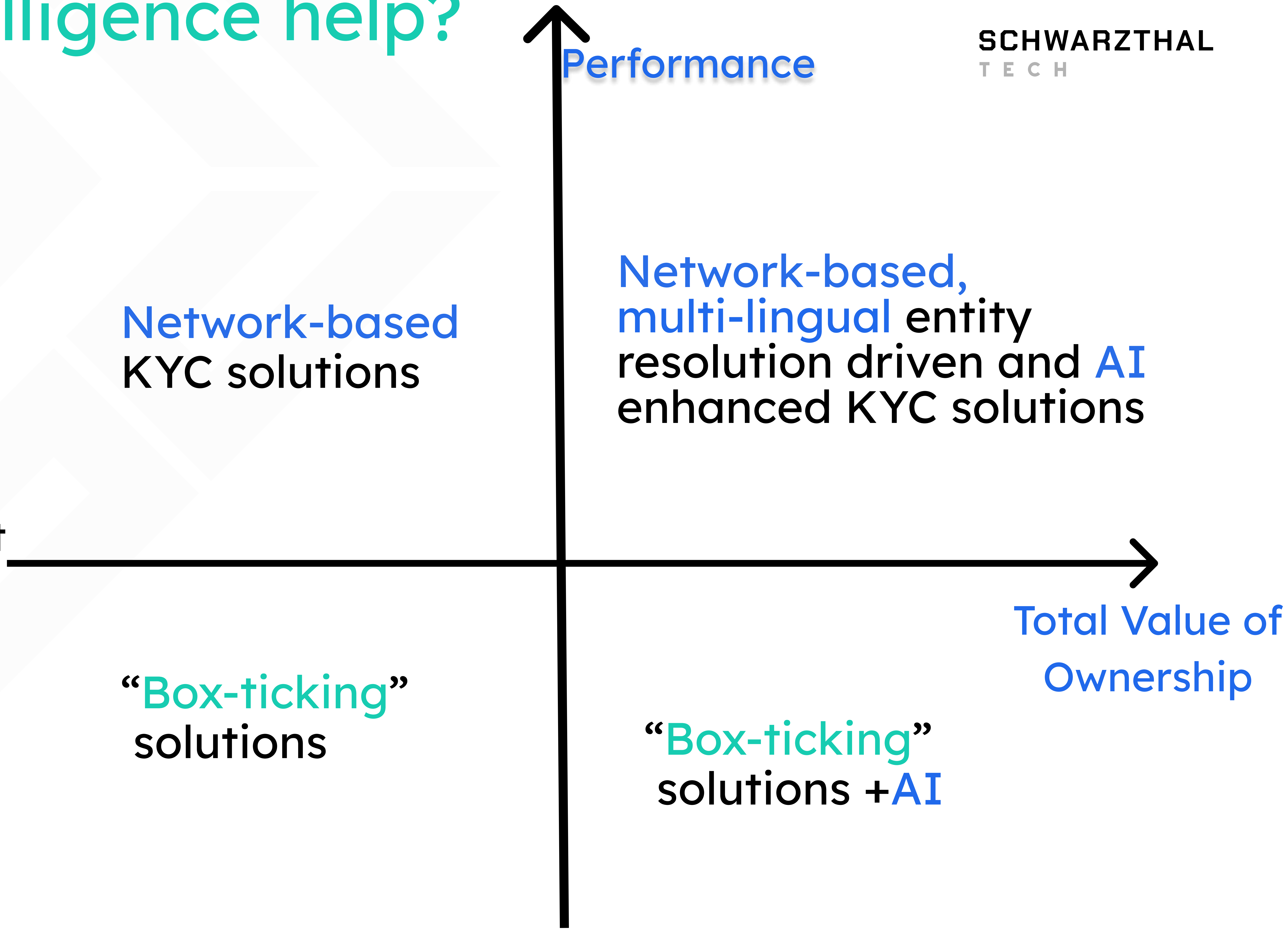
- Box-ticking regulatory driven solutions are less concerned about performance
- Legacy solutions are not cost-effective and require consistent staff expenses
- R&D fuels the high performance



Performance = Risk discrimination capacity (Low false negatives + false positives)

Total Value of Ownership = Savings due to process automation + Gains due to opportunites losses - product cost

Q&A

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Introduction

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- ✓ Founder of Schwarzthal Tech: AI-driven platform providing financial crime intelligence
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- ✓ Expert for the European Parliament on topics like VAT fraud, AML and CTF
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