DATA AND ANALYTICS FOR ENHANCED CUSTOMER KNOWLEDGE AND GREATER VALUE CREATION

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Agenda

CONTEXT & INTRODUCTION

ARTIFICIAL INTELLIGENCE TO ENHANCE RISK MANAGEMENT

EVIDENCE FROM REAL APPLICATIONS

WRAP UP

AN EVOLVING MARKET: THREATS AND OPPORTUNITIES

The need of a new risk management paradigm

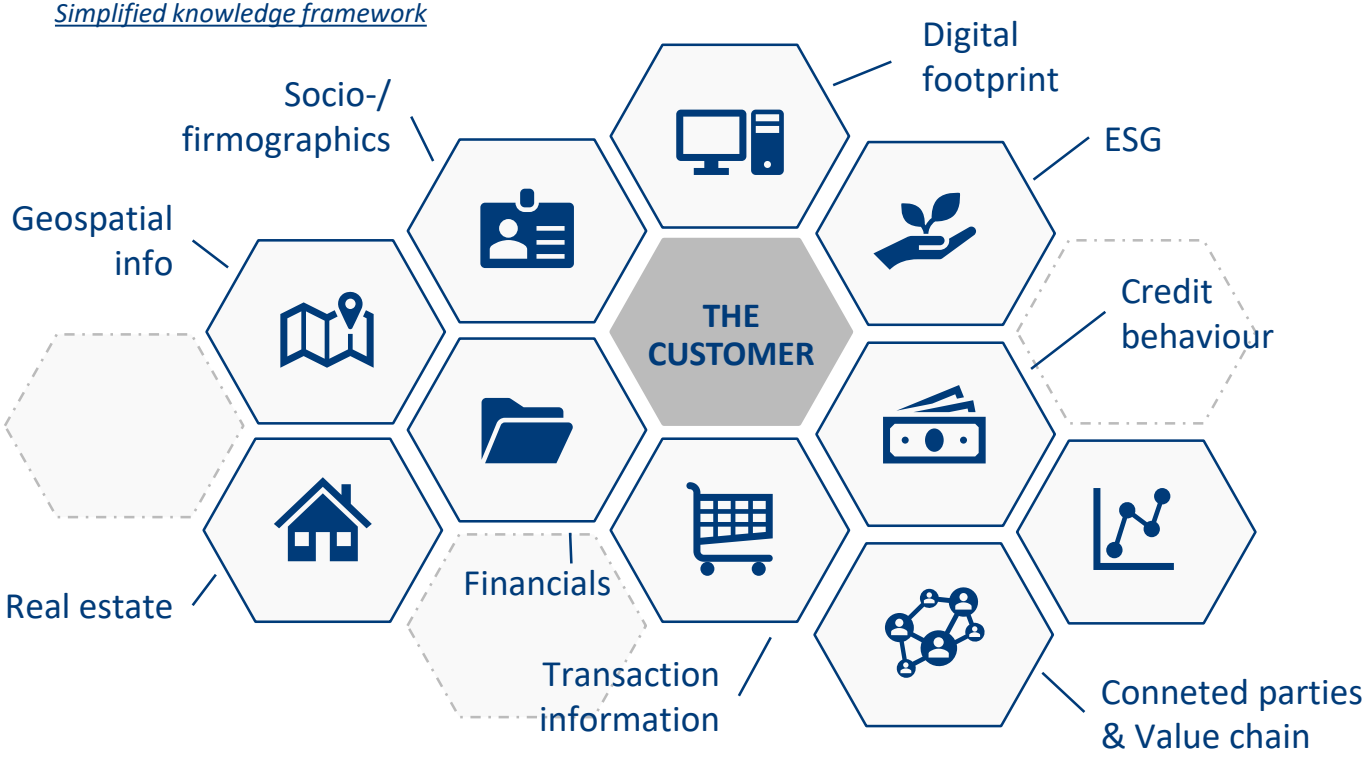
- The market has been characterized for some time by a sort of *general instability* or a *continuous evolution*: competition, regulation, customer behaviours, technology, etc. are all **changing or affecting the *rules of the game***
- In order to «play» the game, institutions need to equipe themselves with more adequate solutions: i. gain **greater customer insight** and ii. make more **effective decisions** (e.g. what to take on, what terms, how, etc.)
- **Technology** is one of the key cards to play as it enables a more and more holistic view of the customers. And it **is moving fast!**

Market forces and trends, illustrative

HOW MUCH DO AND CAN WE KNOW ABOUT A CUSTOMER?

Identify and analyse the customers' multiple facets: a simplified framework

Simplified knowledge framework



A new paradigm

- **New structured and unstructured data** is now also available (in addition to traditional data)
- **Artificial intelligence (from ML to Gen-AI)** is the geme changer: data extraction and effective data management

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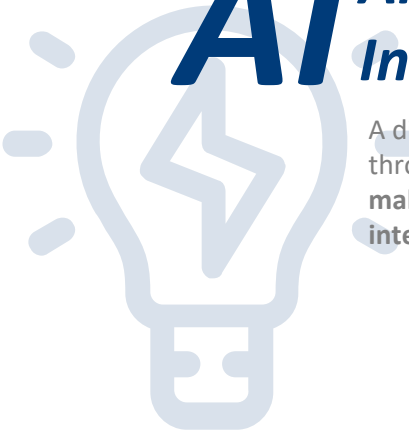
ARTIFICIAL INTELLIGENCE: THE ENABLER

Extract and model information



AI ***Artificial Intelligence***

A discipline that studies how to **simulate**, through a computer, **the decision-making and learning system of human intelligence**

ML ***Machine Learning***

Algorithms and statistical models used by computer systems aimed at machine **learning through** the use of **large amounts of data**

DL ***Deep Learning***

Neural network **algorithms** that simulate the behaviour of the brain to **solve complex tasks** by learning from huge amounts of data

Gen-AI ***Generative Artificial Intelligence***

DL **models capable of generating new observations** that have the same properties as the real data used to generate them

ARTIFICIAL INTELLIGENCE REGULATION IN BANKING

European supervisory authorities' path to assess the impact of AI in the banking world

December 2018

The European Commission publishes the first "Coordinated plan on Artificial Intelligence"

01

February 2020

02

The European Commission publishes 'White Paper on AI' to Promote Adoption and Address Associated Risks

July 2020

03

The European Commission publishes a proposal for a regulation on artificial intelligence that introduces a comprehensive and harmonised regulatory framework for AI.

July 2021

04

EBA publishes an analysis of the current RegTech landscape "Analysis of RegTech in EU Financial sector"

January 2022

05

EBA publishes discussion paper (EBA/DP/2021/04) to evaluate the possible use of Machine Learning in IRB models

June 2023

06

Artificial Intelligence Act

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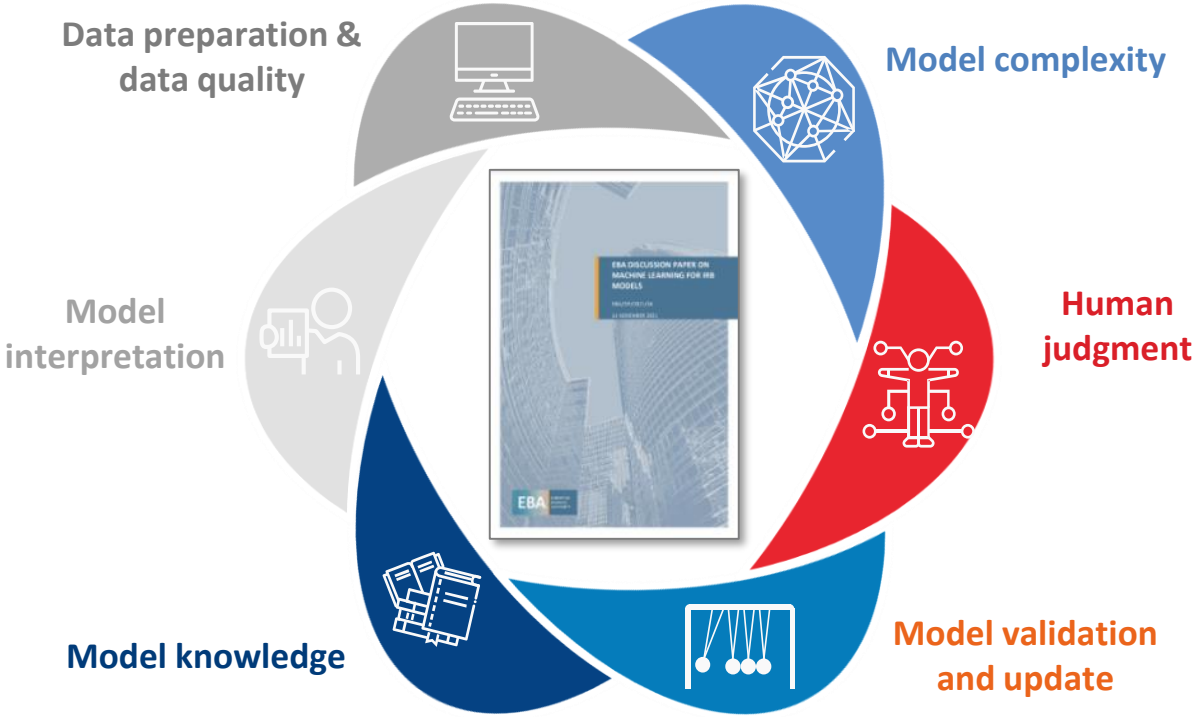
USING ML IN RISK MANAGEMENT: SOME CONCERNS



Debunking the mith

ML poses both methodological and regulatory challenges, mostly when applied to credit risk.

Both industry players and supervisors have become more and more familiar with such methodologies, both accepting them (when properly used)

INDUSTRY APPLICATIONS OF ML IN RISK MANAGEMENT

Discussed with the EBA

Case study	Benefits
A new IRB model aimed at retail SMEs	Provides customers with a full digital experience, focusing on high digitalisation standards and profiting from PSD2 and the GDPR. Deals with unprecedented conditions, e.g. due to Covid-19
A challenger model to validate the IRB model for retail PDs	Performs initial validation to get supervisory clearance, and ongoing validation to promptly highlight any issues emerging from the bank's model
An early warning system based on transaction data	Ability to use transaction data to identify new information patterns
Second-level controls on a retail SME portfolio	Provides credit analysts, performing credit file reviews, with better (risk-based) sampling criteria and additional information. Allows portfolio-wide analyses
Optimising credit policies	Further automates the "credit policies" used to translate credit scores into credit decisions. Cuts costs and increases speed.

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ARTIFICIAL INTELLIGENCE TO ENHANCE RISK MANAGEMENT

EVIDENCE FROM REAL APPLICATIONS
CASE 1 – EARLY WARNING SYSTEM WITH TRANSACTION DATA

WRAP UP

EARLY WARNING SYSTEM WITH TRANSACTION DATA

Tier 1 banking group

BACKGROUND

> Following JST's finding on the existing early warning system, the Bank decided to evolve the solution embracing all new opportunities offered by technology and methodology: in addition to traditional data assets, transaction data is also made available in a *usable* format (i.e. transactions are categorized)

SOLUTION

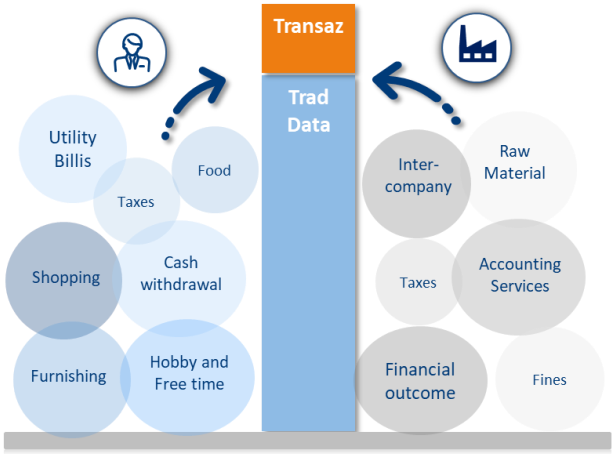
> **AI-based categorization engine** to label each transaction, grouped by type (macro and micro categories): **millions of transactions/month**, **20k+ indicators per customer**

> **ML-based model development**: from data preparation to model estimation (3 ML model pipelines developed for each segment)

GOAL

> **Enhanced model performance** (dealing with JST findings) by **exploiting** value of **additional available data assets**

> **Gain confidence about the (ML) solution** ensuring full understanding of development process and model interpretability



EARLY WARNING SYSTEM WITH TRANSACTION DATA

Categorization and modeling of transaction data

Traditional Information

- **Balance sheet**
- **Internal Behavioural**
- **Credit bureau**
- **Public Info**
- **……**

Transaction info

Cash flow	Ability to **generate cash flow**
Spending type	Raw materials or services, funding costs, betting, medical expenses, etc.
Transaction type	**Regular vs extraordinary transactions**
Taxation	Handling **taxation duties**
Intercompany	Identification **of internal transfers**

Signals

Stability, reactivity to the economic cycle…

Anomalies or unexpected trends in purchases

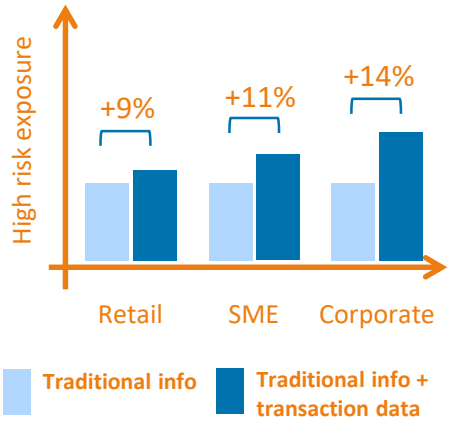
Capturing irregular expenses or revenues

Management of tax payments

Netting intra-company transactions

Real case benefits

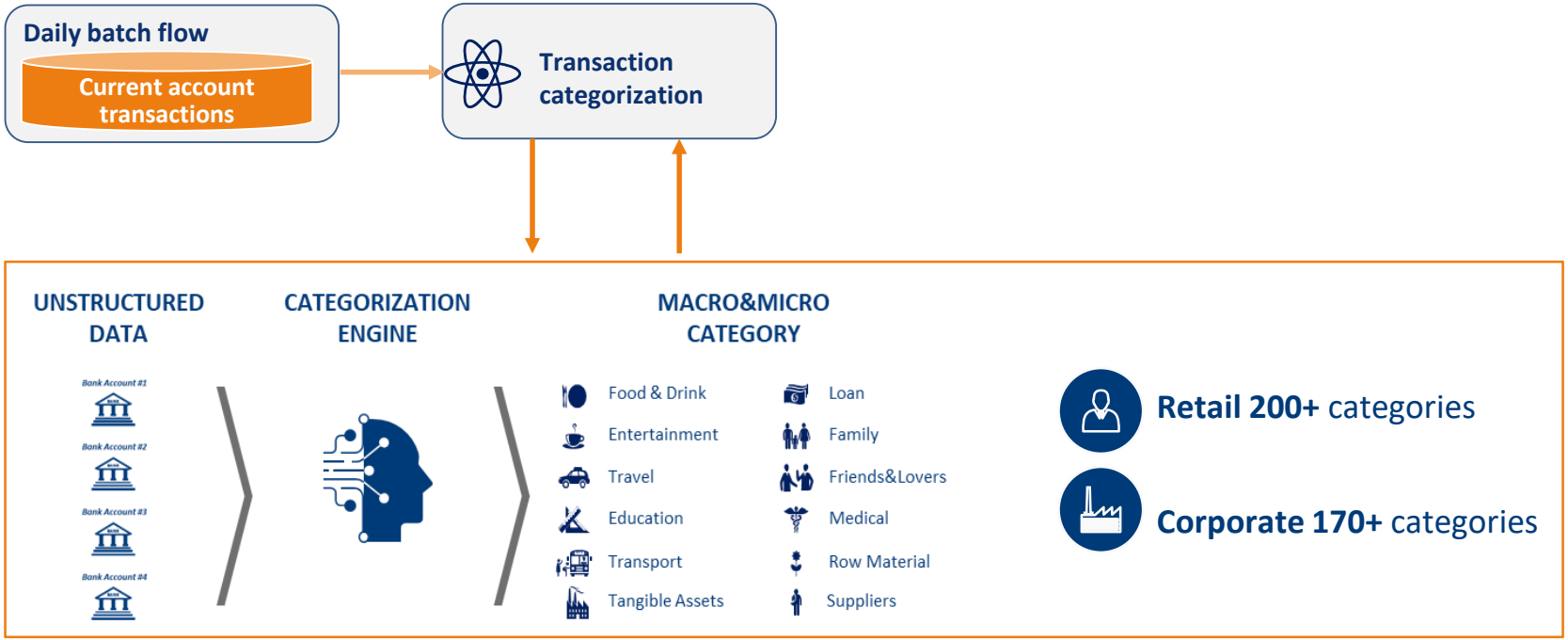
- Up to **15% risky exposure** pre-emptively managed
- Up to **-10% cost of risk**



EARLY WARNING SYSTEM WITH TRANSACTION DATA

AI driven categorization and ML modeling of categorized data

Simplified flow, illustrative



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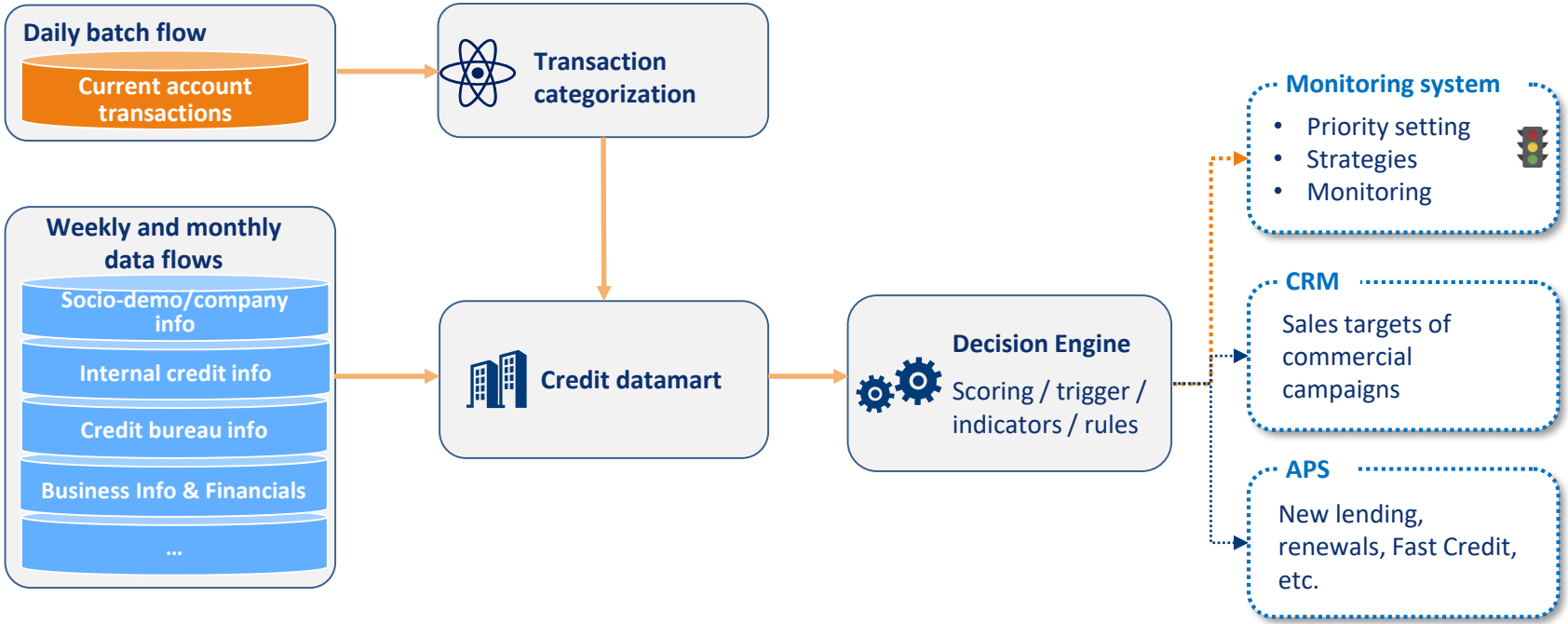
EARLY WARNING SYSTEM WITH TRANSACTION DATA

AI driven categorization and ML modeling of categorized data

Simplified flow, illustrative



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CASE 2 – SECOND LEVEL CONTROL SYSTEM WITH GEN-AI

WRAP UP

SECOND LEVEL CONTROL SYSTEM WITH GEN-AI

Tier 1 banking group

BACKGROUND

- The Bank's Risk Management wants to evolve the current solution in order to allow for a greater analysis of loan application files still keeping constant the number of FTEs involved in the process.
- The current process is fully manual and covers only a minor part of application files randomly selected

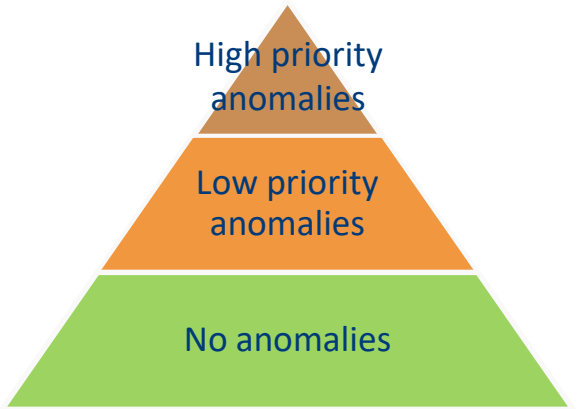
SOLUTION

- **Gen-AI solution** to analyze systematically all of the notes reported in loan applications, identify potential anomalies, rank them by priority grades and provide analysts with pre-assessed cases

GOAL

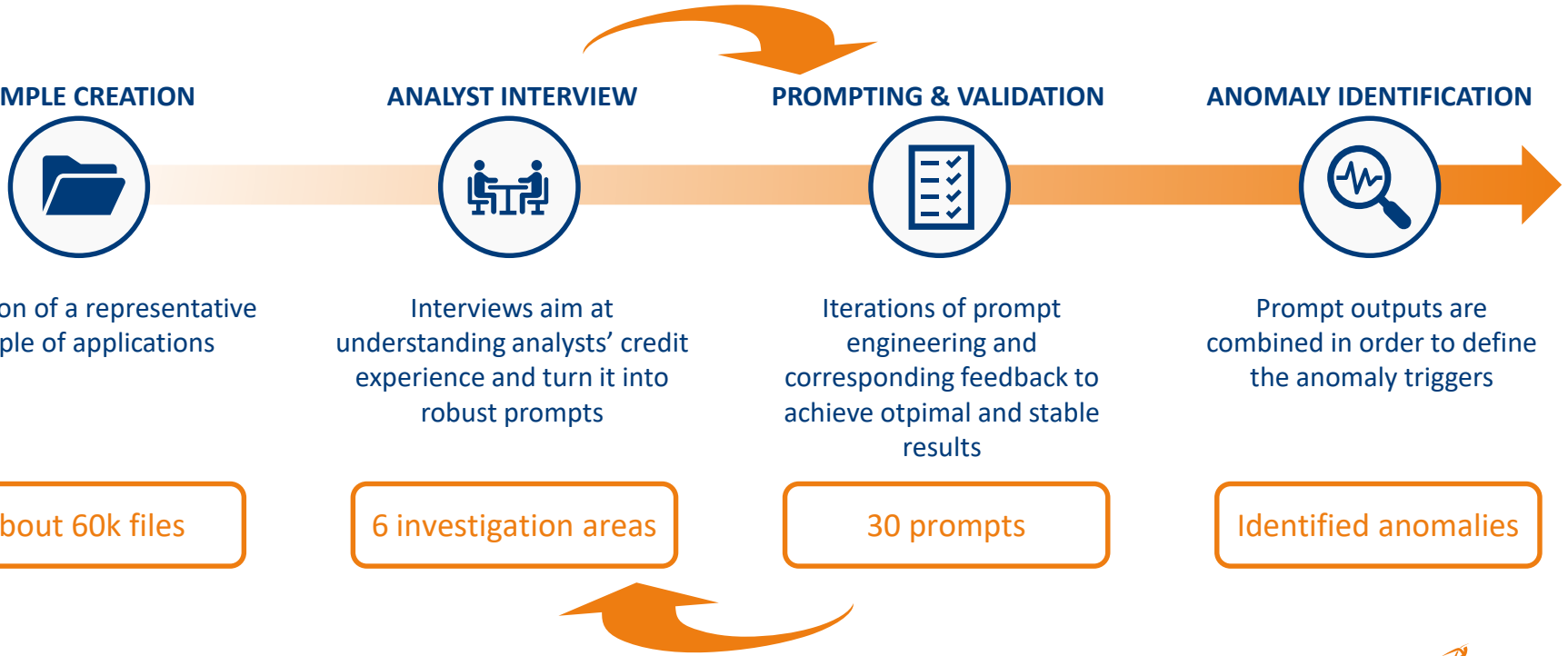
- **Increase effectiveness** of internal control systems
- **Reduce the *psychological effect*** of analysts' assessment
- **Structured set of anomalies**

Illustrative example



IMPLEMENTING THE GEN-AI DRIVEN CONTROLS

The high level process overview



DIRECTING GEN-AI CONTROLS

Definition of the investigation areas: a 2-phase approach

Phase 1

1. **Credit policies**
   Bank's strategy towards the customer (e.g. Develop, reduce, etc.) and coherence of analysts' comments
2. **UTP**
   NPL/UTP exposures detected by the analyst
3. **Cost structure**
   Issues with high costs, with tax duties, and operating inefficiencies
4. **Cash flows**
   Analysis of cashflows with focus on debt sustainability and future revenues
5. **Conditional decision**
   Identification of conditions set by the analysts and to which decision is subject
6. **Legal proceedings**
   Identification of past and current legal proceedings identified by the analyst

Phase 2

7. **Collateral assessment**
8. **Inventories**
9. **…**
10. **…**
11. **…**

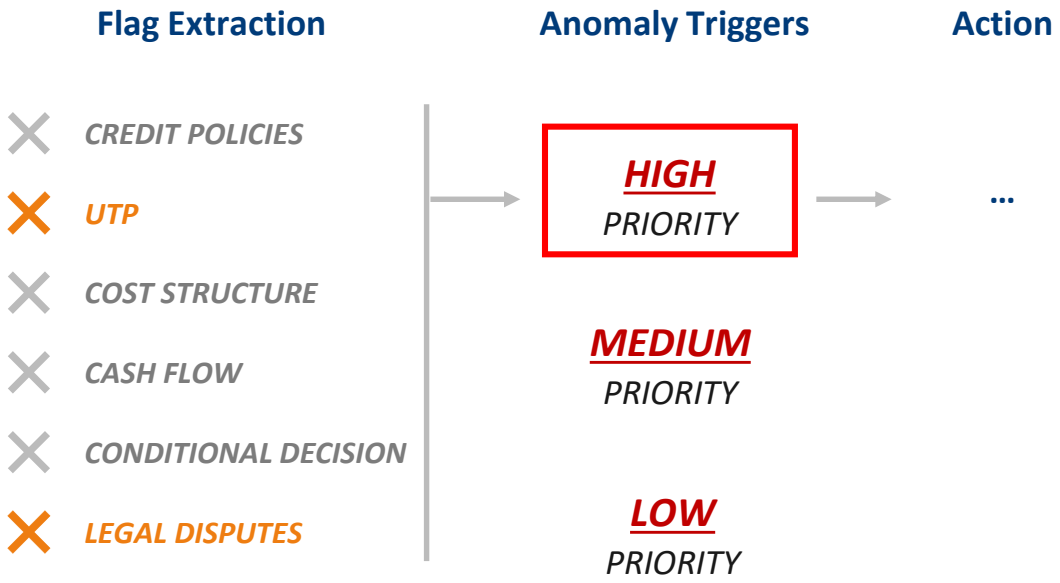
ANALYSIS OF INVESTIGATION AREAS WITH GEN- AI

A real example – Reading, understanding and managing comments

Application 1

Proposed Note:
The customer asks us for an increase in the cash credit limit of XXXX euros …. to cope with the expenses for the goods warehouse in anticipation of the summer season …. … customers are reported for X unpaid installments on the financing of the remaining XXXXX euros. Heard, they told us that it is a dispute with XXXXXXX, which financed the …… supply of the company XXXXX with which customers had signed a supply contract with a fixed monthly rate: however, this company XXXXXX would have stopped providing the service since …….. As a result, customers have had to sign a new …… supply contract with XXXXXX, while XXXXXXX continues to require payment of the monthly installment for the service not provided by XXXXXXX

Note Resolution:
AGREES, IN SPITE OF THE NEGATIVITIES ARGUED IN THE PROPOSAL NOTES AND THE RESULTS OF CREDIT POLICIES, ON THE BASIS OF THE EXPERIENCED KNOWLEDGE OF THE COUNTERPARTY.



ANALYSIS OF INVESTIGATION AREAS WITH GEN- AI, RESULTS

Different anomalies and their combinations can be found, triggering different priorities

Illustrative

	UTP	COST STRUCTURE	CASH FLOWS	CONDITIONAL DECISION	LEGAL PROCEEDINGS	TOTAL
HIGH						2%
MEDIUM	/				/	8%
LOW	/	/	/		/	15%
NO ANOMALIES	/	/	/	/	/	75%

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SOME FINAL THOUGHTS

- "**Technology is neither good nor bad; nor is it neutral**" (Kranzberg's Law #1[1])
- Industry and regulators are all aware of the benefits that technology may make available and the risks linked to it
- However, this is an **irreversible process**: it is estimated that Amazon, Microsoft, Meta and Google will have invested more than 200 billions dollars by end of 2024. That is a clear sign of where we are going
- "**Technology is a very human activity – and so is the history of technology** " (Kranzberg's Law #6)

[1] Kranzberg, M. (1986). Technology and History: "Kranzberg's Laws." *Technology and Culture*, *27*(3), 544–560

For further information

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THANK YOU!

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