



The 2025 CFRR Ministerial Conference

Debunking AI in financial reporting

Eleonora Laurenza

March 18, 2025, Imperial Riding School Hotel, Vienna, Austria

CFRR»»

Centre for Financial and
Sustainability Reporting Reform



REPARIS
FOR SMEs

PULSAR



EAASURE

The CFRR Programs are co-funded by

 Federal Ministry
Republic of Austria
Finance

 Austrian
Development
Cooperation

 Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs,
Education and Research EAER
State Secretariat for Economic Affairs SECO



European Union

WHAT'S ARTIFICIAL INTELLIGENCE?

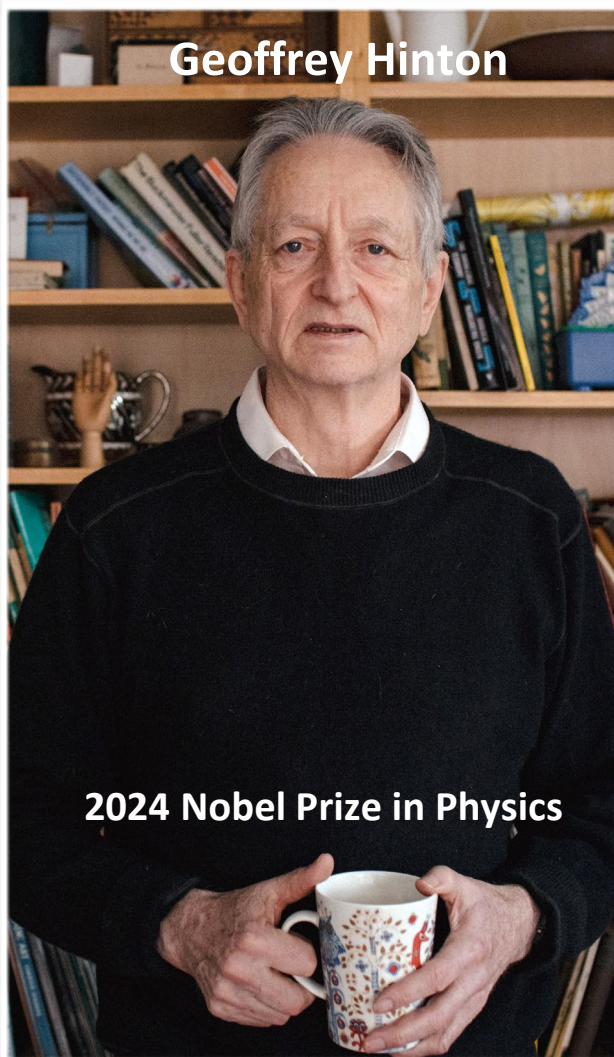
Demis Hassabis



2024 Nobel Prize in Chemistry

Photo: Duncan Hull, CC BY-SA 4.0

Geoffrey Hinton



2024 Nobel Prize in Physics

Photo: Chloe Ellingson/The New York Times

John Hopfield



2024 Nobel Prize in Physics

Photo: Princeton University



WHAT'S ARTIFICIAL INTELLIGENCE?

Artificial Intelligence is a field of study

"AI is making machines do things
that would require intelligence
if done by humans."

"AI is understanding the nature of
intelligence in machines...
...and, why not, in humans."

AI as a field
is relevant in multiple disciplines.

Nobel...

will AI increase human productivity?
will AI revolutionize science?
will humans become smarter?
will AI replace human in many jobs?
...
will AI cause human extinction?

Technology is its application

AI Act (Regulation (EU) 2024/1689 art. 3

'AI system' means a machine-based system that is designed to operate with varying levels of autonomy and that may exhibit adaptiveness after deployment, and that, for explicit or implicit objectives, infers, from the input it receives, how to generate outputs such as predictions, content, recommendations, or decisions that can influence physical or virtual environments.

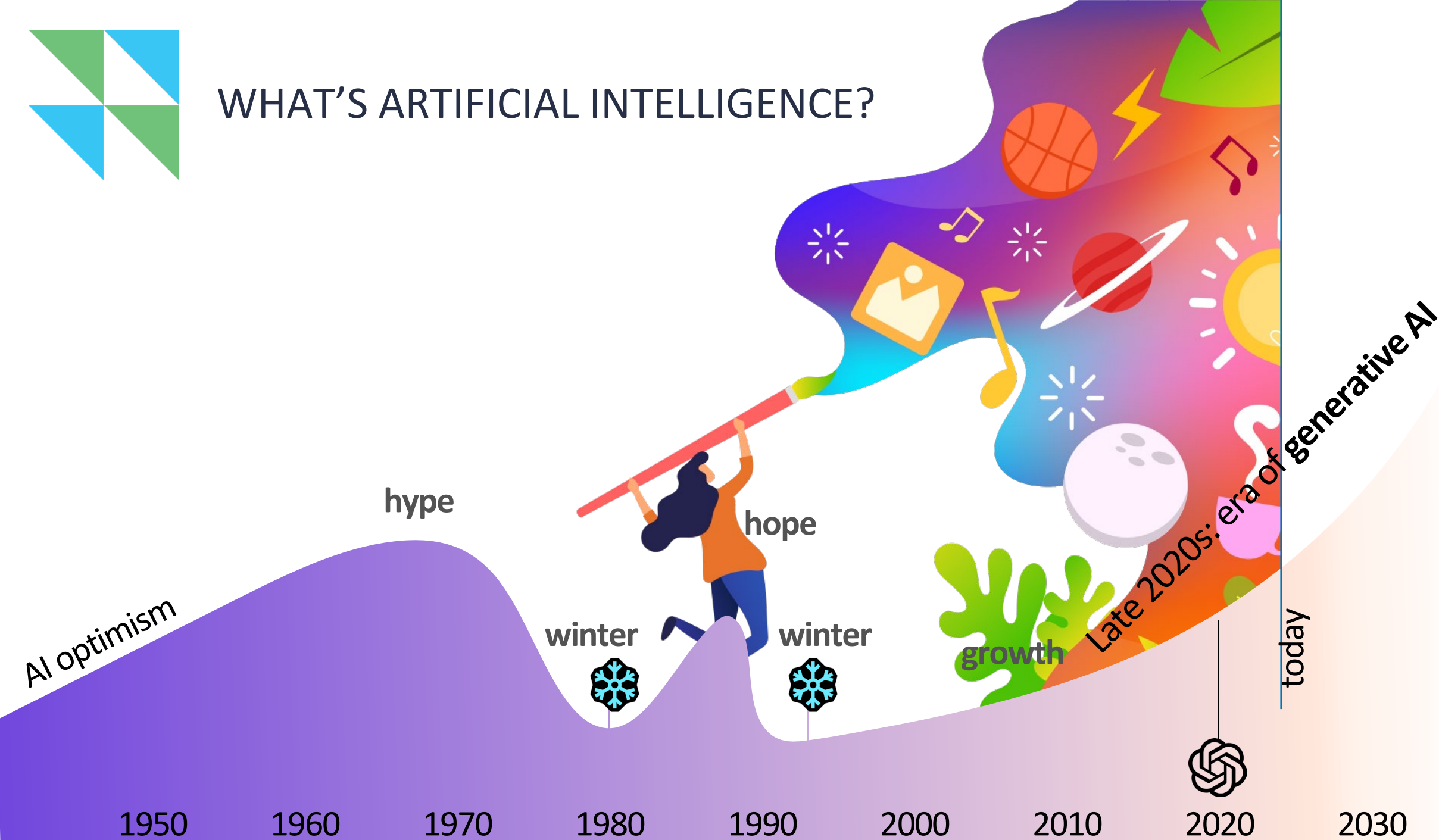
AI as a technology
is relevant in multiple domains.

Society...



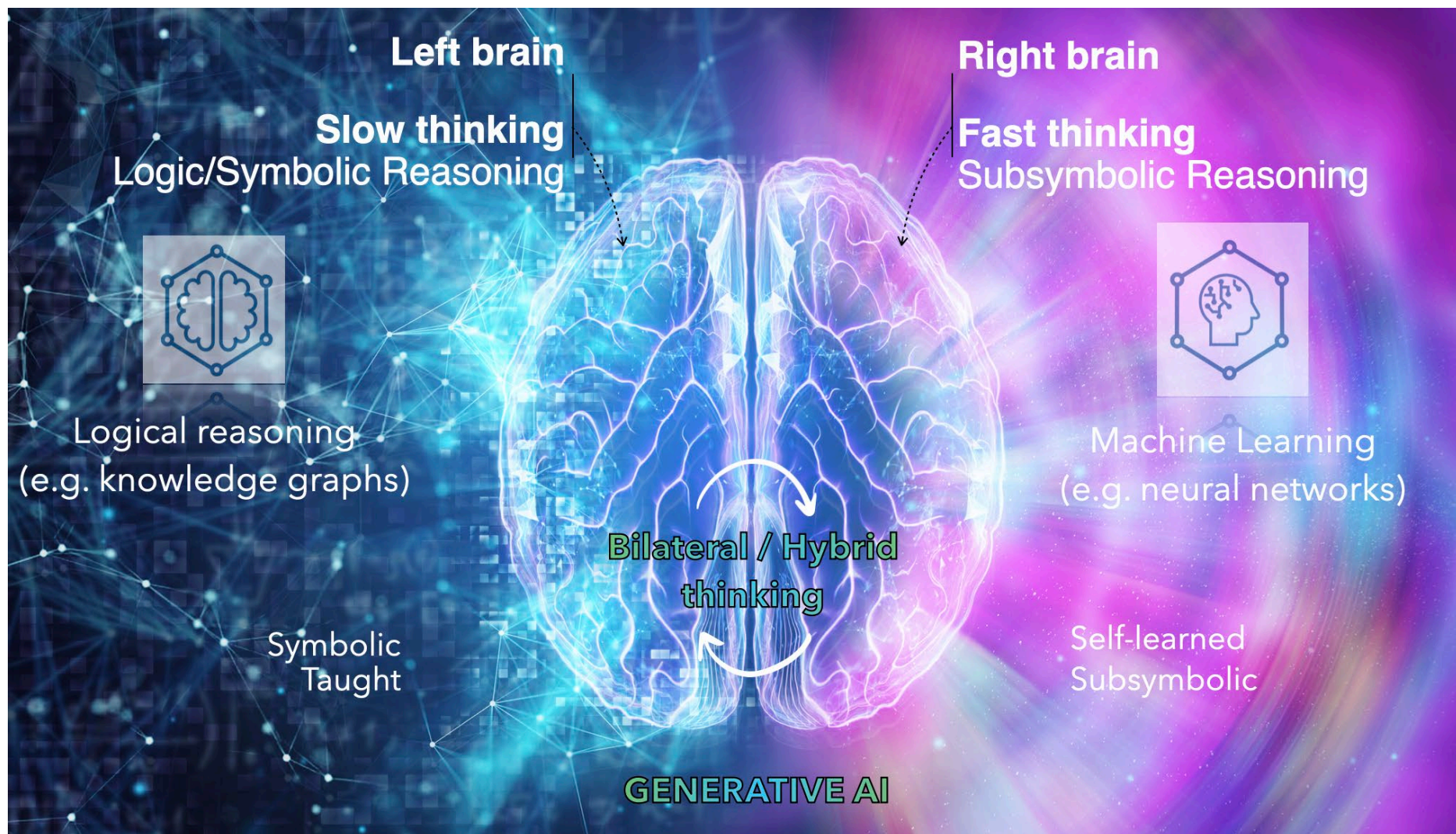


WHAT'S ARTIFICIAL INTELLIGENCE?





WHAT'S ARTIFICIAL INTELLIGENCE?





PURE INDUCTIVE AI (FAST THINKING)



[FORBES ARTICLE](#)

FORBES > BUSINESS

BREAKING

Lawyer Used ChatGPT In Court —And Cited Fake Cases. A Judge Is Considering Sanctions

Molly Bohannon Forbes Staff

*Molly Bohannon has been a Forbes news reporter
since 2023.*

Updated Jun 8, 2023, 03:42pm EDT

TOPLINE The lawyer for a man suing an airline in a routine personal injury suit used ChatGPT to prepare a filing, but the artificial intelligence bot delivered fake cases that the attorney then presented to the court, prompting a judge to weigh sanctions as the legal community grapples with one of the first cases of AI “hallucinations” making it to court.



PURE INDUCTIVE AI (FAST THINKING)



Given that MyCom owns 51.07% of "Società di Gestione BestBanca" and "Società di Gestione BestBanca" owns the 23.1% of the shares of BestBanca, **would the control of BestBanca change** if MyCom s.r.l. bought 30% of BestBanca's shares from the market?



GPT4
June 2024





PURE INDUCTIVE AI (FAST THINKING)



Given that MyCom owns 51.07% of "Società di Gestione BestBanca" and "Società di Gestione BestBanca" owns the 23.1% of the shares of BestBanca, **would the control of BestBanca change** if MyCom s.r.l. bought 30% of BestBanca's shares from the market?



GPT4
June 2024



(...) MyCom effectively controls approximately 11.85% ($51.07\% * 23.1\%$) of BestBanca's shares (...)

Now, if MyCom s.r.l. were to buy an additional 30% of BestBanca's shares from the market, it (...) could impact control:

1. Direct Ownership Increase: (...) its direct ownership stake in BestBanca would increase by 30%.
2. Combined Ownership: MyCom s.r.l. would then own approximately 41.85% ($11.85\% + 30\%$) of BestBanca's shares (...)
3. Potential for Majority Control: Depending on (...) structure (...) and (...) distribution of shares (...), MyCom s.r.l. could potentially achieve majority control of BestBanca with this increased ownership stake.
4. Voting Rights and Board Representation: With a majority ownership stake, MyCom s.r.l. would likely have significant influence (...)
5. Regulatory Considerations: (...)

In summary, if MyCom s.r.l. were to buy 30% of BestBanca's shares from the market (...) it (...) **could potentially achieve** majority control of BestBanca (...)

lack of knowledge

lack of factuality

lack of context

lack of reasoning

lack of common sense

lack of explanation

Horoscope answer!





PURE DEDUCTIVE AI (SLOW THINKING)

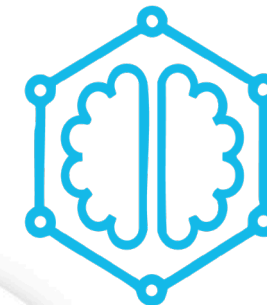


Table P

Person	Parent
Luigi	Giusto
Augusto	Giusto
Mario	Umberto
Sandra	Paola
Umberto	Vincenzo
Paola	Vincenzo
Enzo	Mario
Laura	Sandra

Who are the **pairs of persons**
of the **same generation**?

Every person
belongs to a
generation

$$P(x) \Rightarrow \dots \\ \exists q \ G(x, q)$$

$$P(x, v), P(y, w), \\ G(v, z), G(w, z) \Rightarrow \\ \exists q \ G(x, q), G(y, q)$$

.....
If parents are in the same
generation, children are in the
same generation

Person	Person
Luigi	Augusto
Umberto	Paola
Mario	Sandra
Enzo	Laura

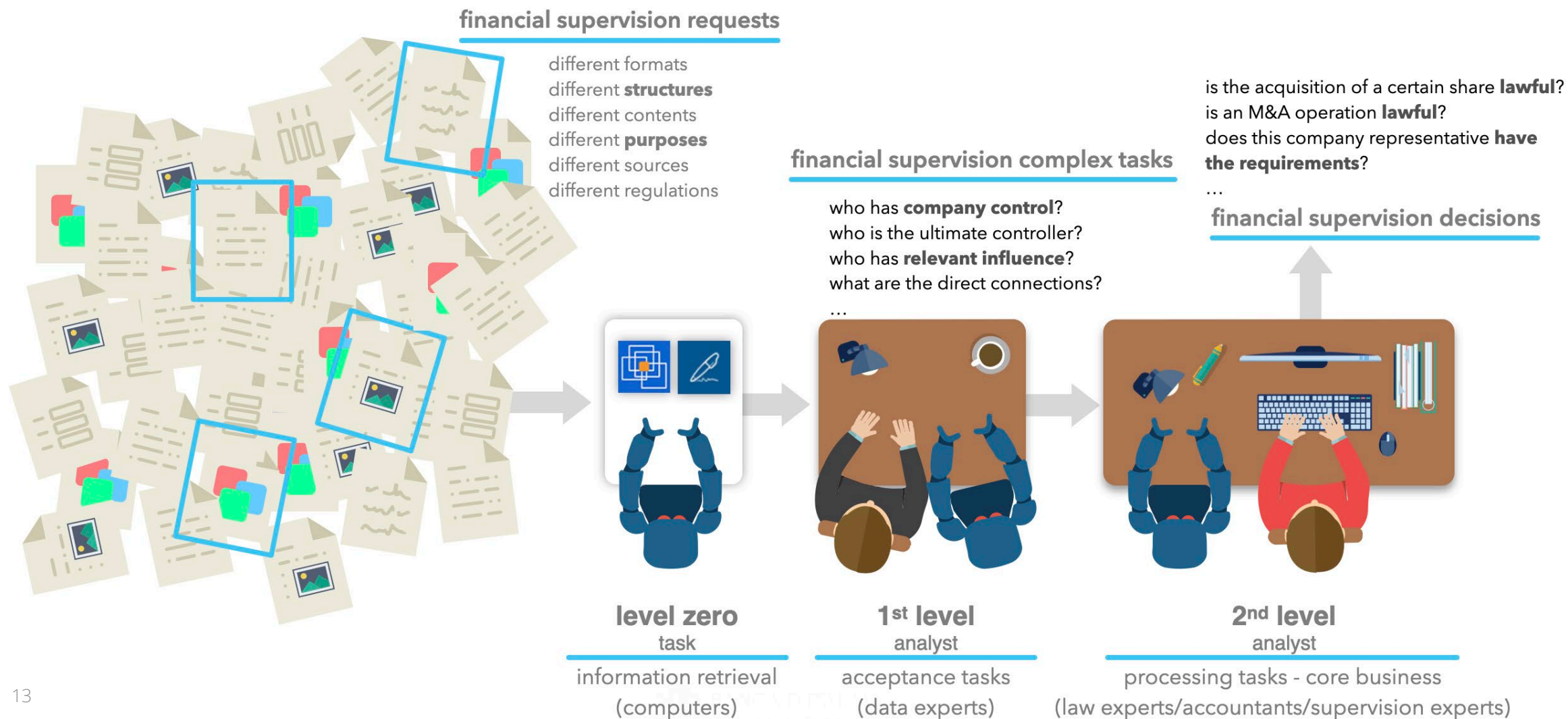




HYBRID AI BUSINESS CASE IN FINANCIAL SUPERVISION: KGROAR

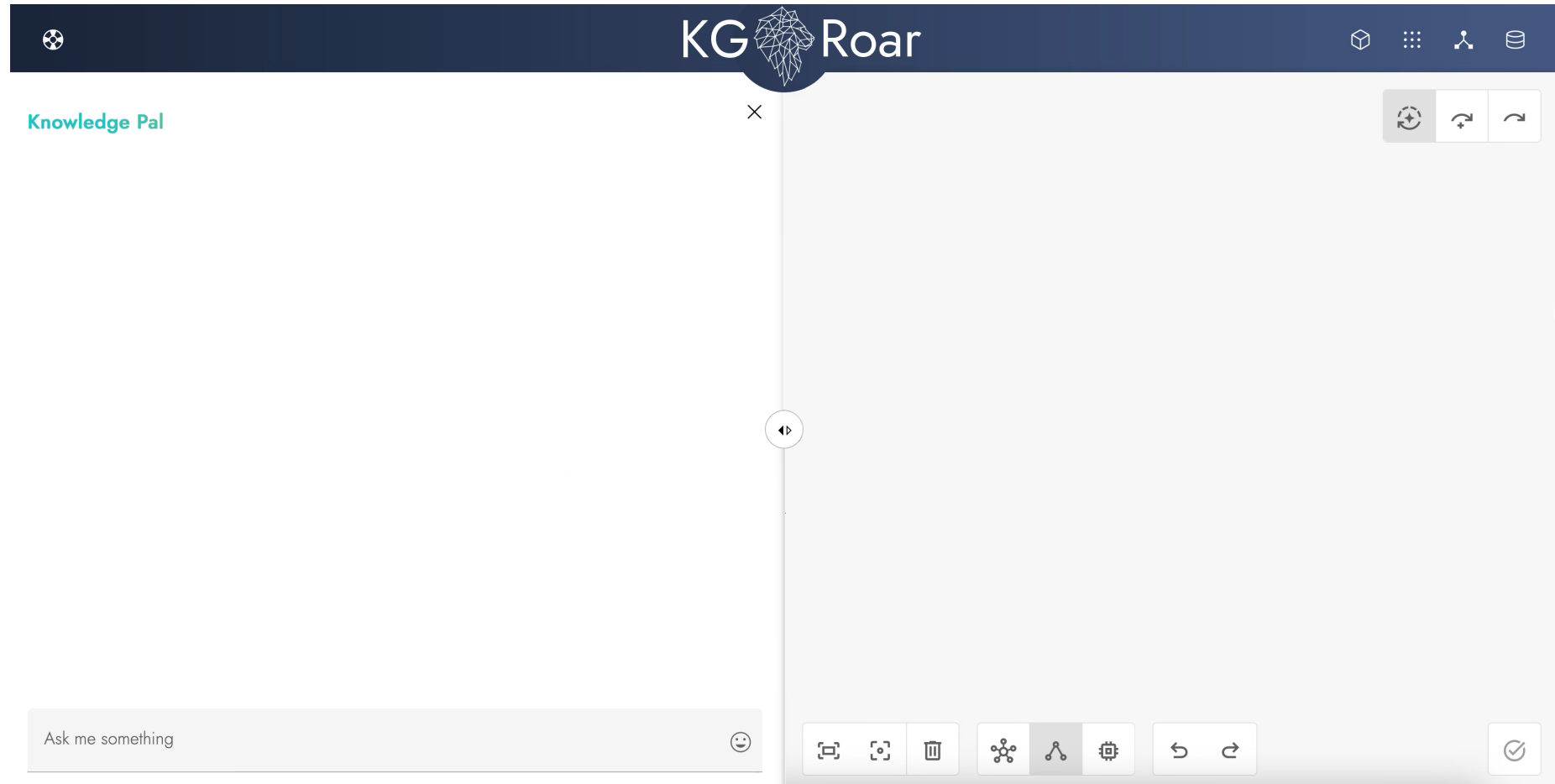
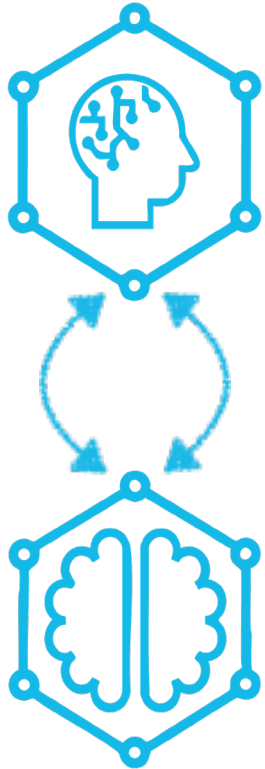


BUSINESS CASE IN FINANCIAL SUPERVISION



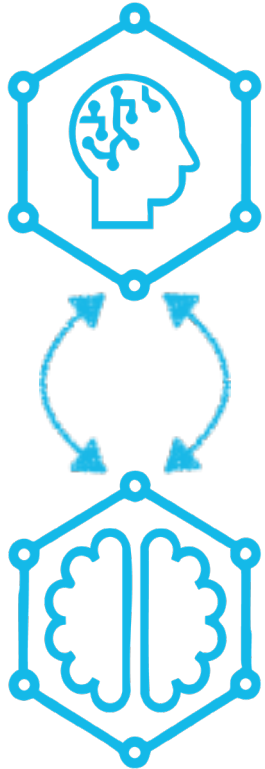


Hybrid AI in Financial Supervision: KG ROAR





Hybrid AI in Financial Supervision: KG ROAR



KG Roar

Knowledge Pal

×

◀ ▶

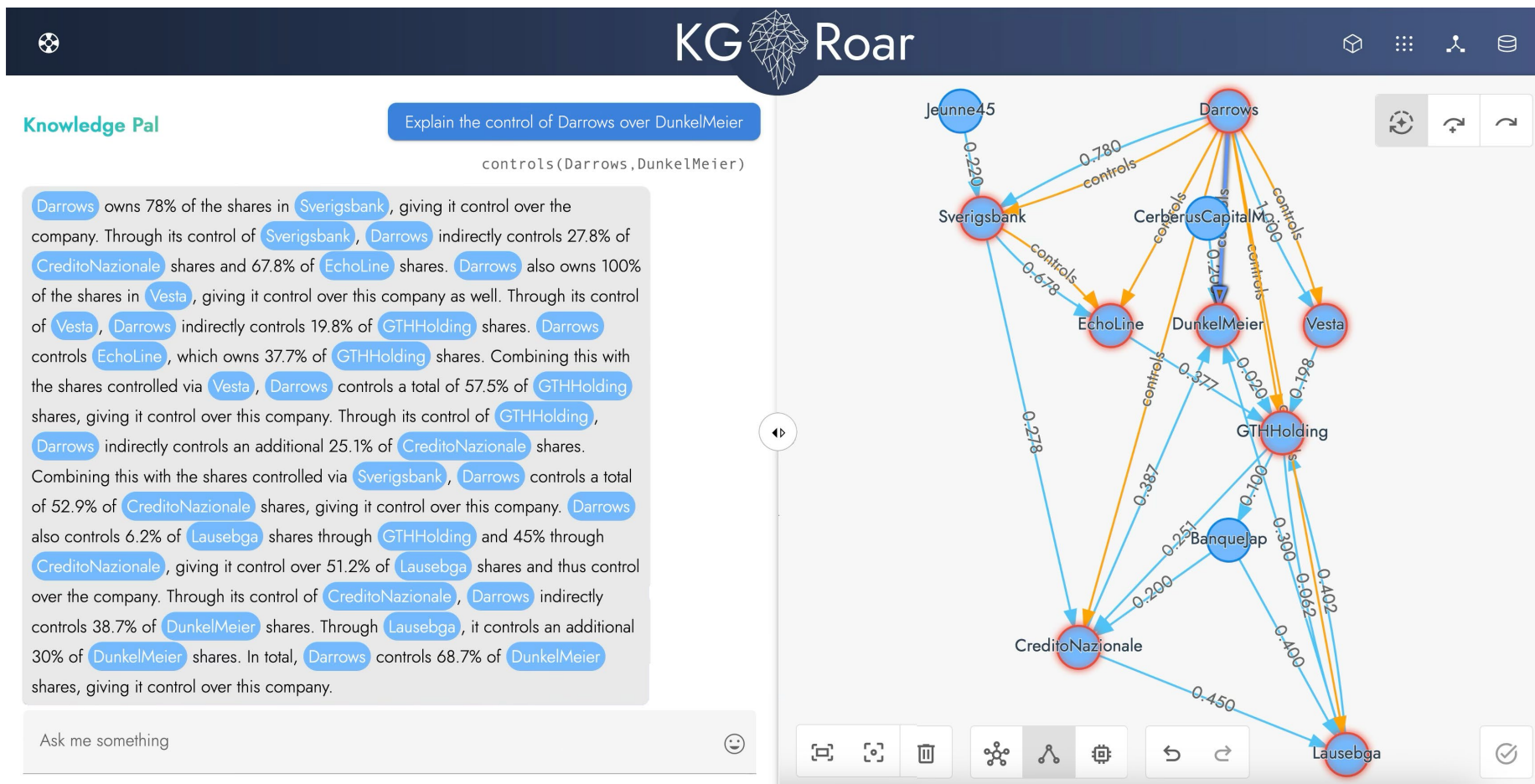
◀ ▶ ↺ ↻

Explain the control of Darrows over DunkelMeier

... controls(Darrows,DunkelMeier)

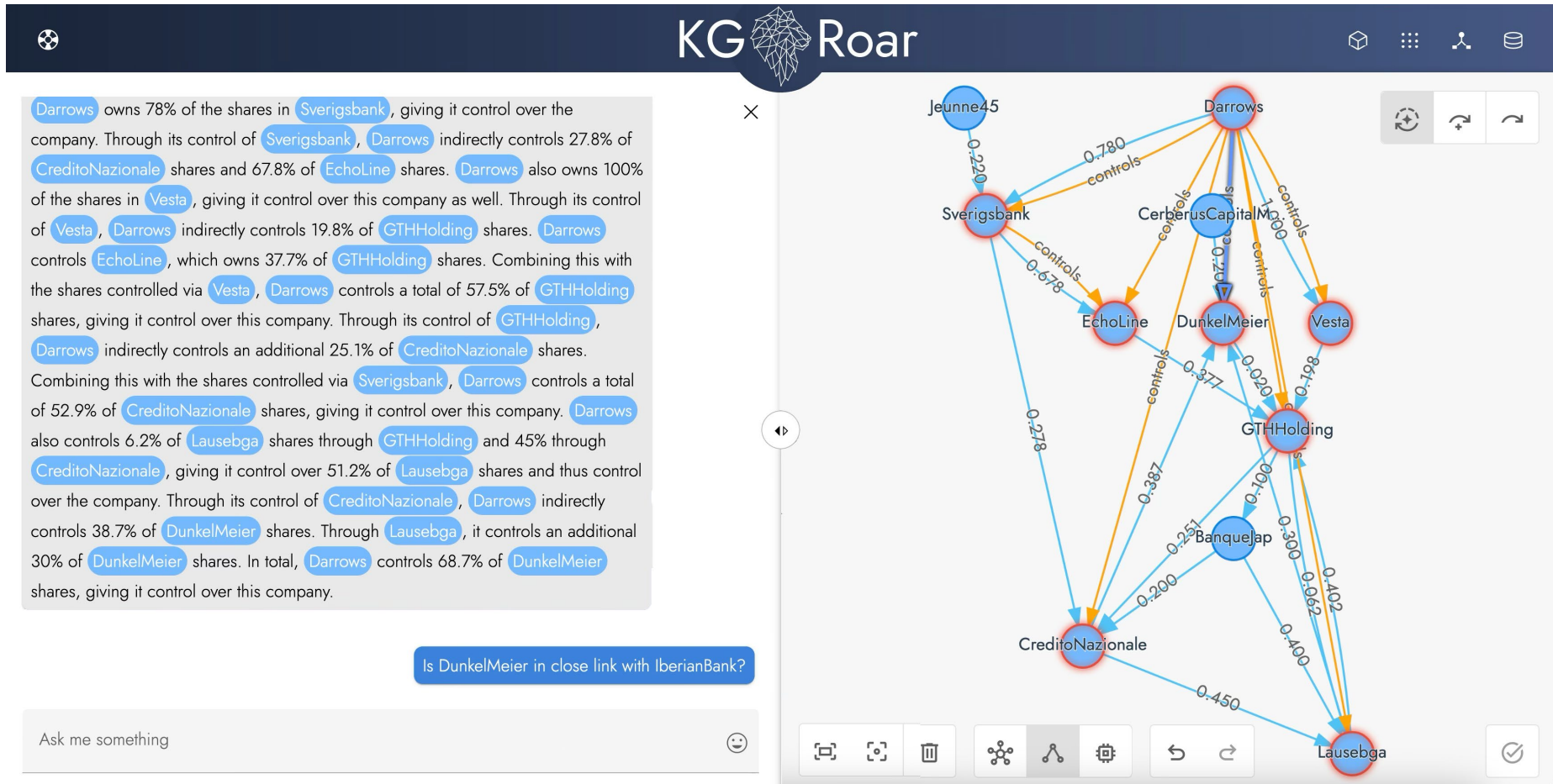
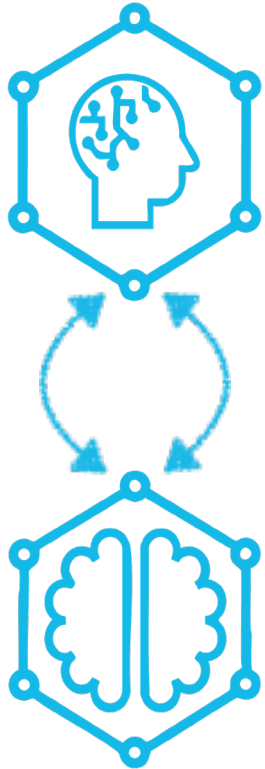
Ask me something 😊

🔍 📄 🗑️ 🌐 🔗 📱 ⏪ ⏩ ✓



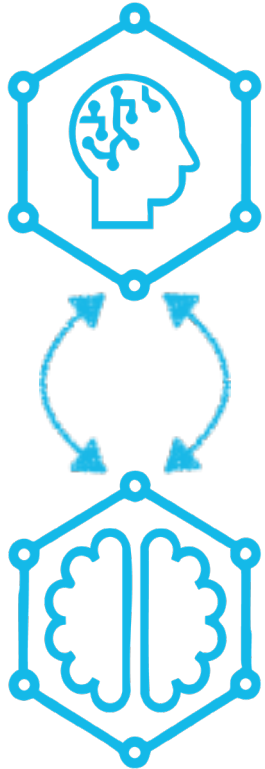




Hybrid AI in Financial Supervision: KG ROAR





Hybrid AI in Financial Supervision: KG ROAR



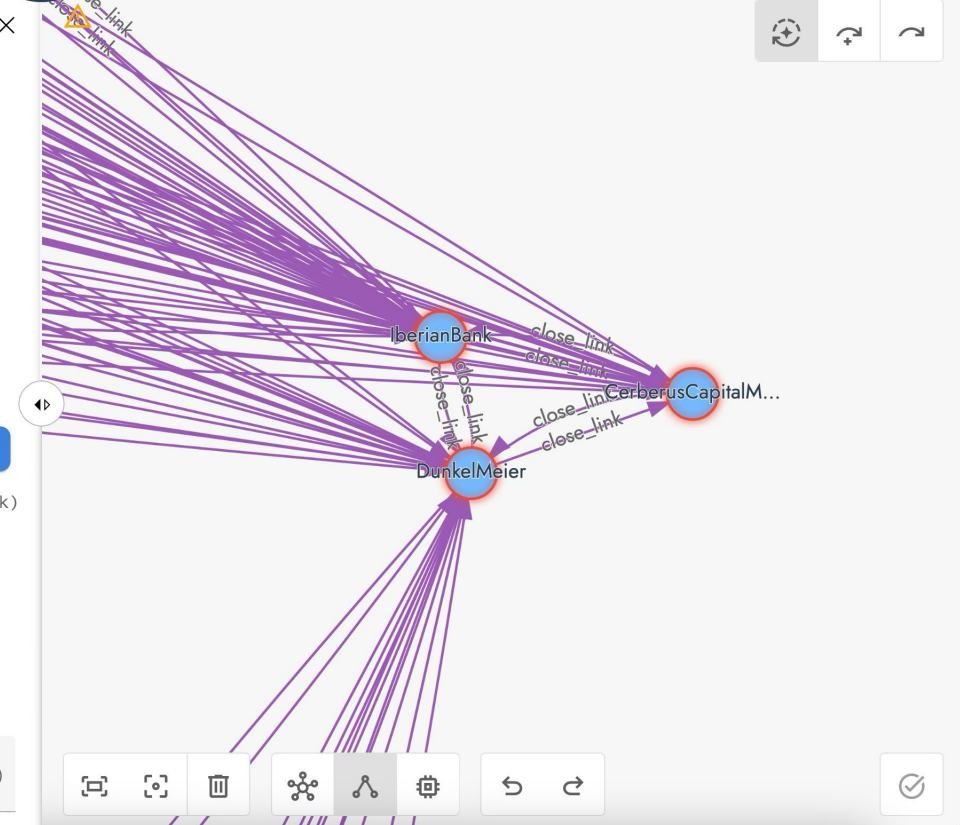
KG Roar

the shares controlled via **CreditoNazionale** / **Darrows** controls a total of 52.9% of **CreditoNazionale** shares, giving it control over this company. Through its control of **GTHHolding**, **Darrows** indirectly controls an additional 25.1% of **CreditoNazionale** shares. Combining this with the shares controlled via **Sverigsbank**, **Darrows** controls a total of 52.9% of **CreditoNazionale** shares, giving it control over this company. **Darrows** also controls 6.2% of **Lausebga** shares through **GTHHolding** and 45% through **CreditoNazionale**, giving it control over 51.2% of **Lausebga** shares and thus control over the company. Through its control of **CreditoNazionale**, **Darrows** indirectly controls 38.7% of **DunkelMeier** shares. Through **Lausebga**, it controls an additional 30% of **DunkelMeier** shares. In total, **Darrows** controls 68.7% of **DunkelMeier** shares, giving it control over this company.

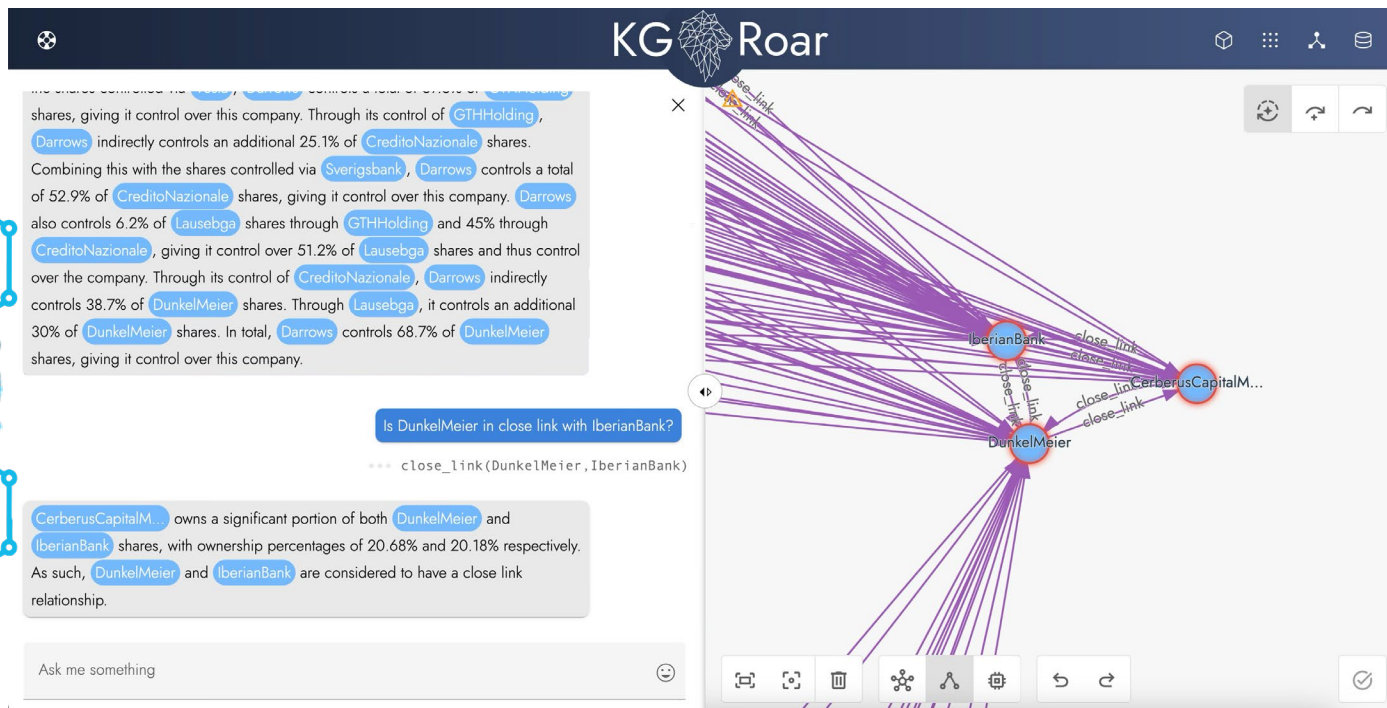
Is DunkelMeier in close link with IberianBank?

```
*** close_link(DunkelMeier, IberianBank)
```

CerberusCapitalM... owns a significant portion of both **DunkelMeier** and **IberianBank** shares, with ownership percentages of 20.68% and 20.18% respectively. As such, **DunkelMeier** and **IberianBank** are considered to have a close link relationship.



Hybrid AI in Financial Supervision: KG ROAR



The screenshot displays the KG Roar interface. On the left, a text-based reasoning engine provides context and answers queries. The main area shows a knowledge graph with nodes representing companies and banks, connected by edges. A query is entered at the bottom: "Is DunkelMeier in close link with IberianBank?". The interface includes a search bar, a query input field, and a results section.

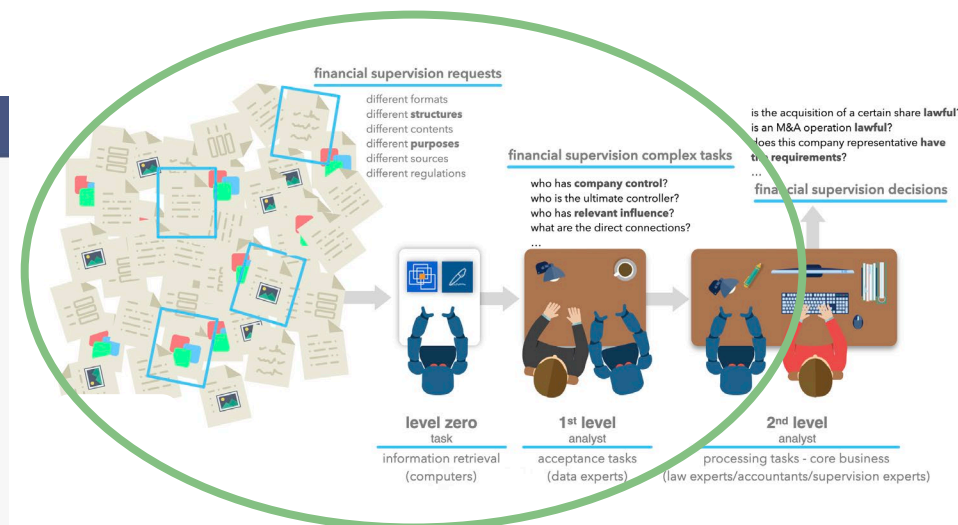
Text from the reasoning engine:

... shares, giving it control over this company. Through its control of GTHolding, Darrows indirectly controls an additional 25.1% of CreditoNazionale shares. Combining this with the shares controlled via Sverigsbank, Darrows controls a total of 52.9% of CreditoNazionale shares, giving it control over this company. Darrows also controls 6.2% of Lausebga shares through GTHolding and 45% through CreditoNazionale, giving it control over 51.2% of Lausebga shares and thus control over the company. Through its control of CreditoNazionale, Darrows indirectly controls 38.7% of DunkelMeier shares. Through Lausebga, it controls an additional 30% of DunkelMeier shares. In total, Darrows controls 68.7% of DunkelMeier shares, giving it control over this company.

Query: Is DunkelMeier in close link with IberianBank?

*** close_link(DunkelMeier,IberianBank)

CerberusCapitalM... owns a significant portion of both DunkelMeier and IberianBank shares, with ownership percentages of 20.68% and 20.18% respectively. As such, DunkelMeier and IberianBank are considered to have a close link relationship.



REFERENCES:

[“KG-Roar: Interactive Datalog-Based Reasoning on Virtual Knowledge Graphs.”](#)

Bellomarini, Luigi; Benedetti, Marco; Gentili, Andrea; Magnanimi, Davide; Sallinger, Emanuel
Proceedings of the VLDB Endowment, vol. 16, no. 12, 2023, pp. 4014–17.

[“Data Science with Vadalog: Knowledge Graphs with Machine Learning and Reasoning in Practice.”](#)

Bellomarini, Luigi; Fayzakhmanov, Ruslan; Gottlob, Georg; Kravchenko, Andrey; Laurenza, Eleonora; Nenov, Yavor; Reissfelder, Stéphane; Sallinger, Emanuel; Sherkhonov, Evgeny; Vahdati, Sahar; Wu, Lianlong
Future Generation Computer Systems, vol. 129, 2022, pp. 407–22.

[“Vadalog: A Modern Architecture for Automated Reasoning with Large Knowledge Graphs.”](#)

Bellomarini, Luigi; Benedetto, Davide; Gottlob, Georg; Sallinger, Emanuel
Information Systems (Oxford), vol. 105, 2022,.



HYBRID AI CASE STUDY IN ACCOUNTING REPORTING: FINREP

ACCOUNTING REPORTING: FINREP

Directive 2013/36/UE - CRS IV

Regulation (EU) No 575/2013

Regulation (EU) 2021/451

Regulation (EU) 2024/3117

IAS – IFRIC - IFRS

EBA reporting framework

Implementing technical standards

Annex V



OJ L, 27.12.2024

EN

1. Balance Sheet Statement [Statement of Financial Position]

1.2 Liabilities

27.6.2013

	References	breakdown in table	Carrying amount

eba European
Banking
Authority

ANNEX V

INSTRUCTIONS FOR REPORTING ON FINANCIAL INFORMATION

Annex V, Part 1.37

8

Annex V, Part 1.38-41

8

EN

balance sheet items

IAS 1.54(n-o)

IAS 1.54(n); IAS 12.5

Accounting Directive art 17(1)(f);
CRR art 4(1)(108)

IAS 32 IE 33; IFRIC 2; Annex
V, Part 2.12

Annex V, Part 2.13

Annex V, Part 2.13

IAS 1.54 (p); IFRS 5.38, Annex
V, Part 2.14

Annex V, Part 1.29

IAS 1.9(b); IG 6

57. 'Share capital repayable on demand' shall include the capital instruments issued by the institution that do not meet the criteria to be classified in equity. Institutions shall include in this item the cooperative shares that do not meet the criteria to be classified in equity.

0290 Liabilities included in disposal groups classified as held for sale

IAS 1.54 (p); IFRS 5.38,
Annex V, Part 2.14

0300 TOTAL LIABILITIES

IAS 1.9(b); IG 6



ACCOUNTING REPORTING: FINREP

OJL, 27.12.2024

Official Journal
of the European Union

EN
L series

2024/3117

27.12.2024

1. Balance Sheet Statement [Statement of Financial]

1.2 Liabilities

0010	
0020	
0030	
0040	
0050	
0060	
0070	
0080	
0090	
0100	
0110	
0120	
0130	
0140	
0150	
0160	
0170	
0180	
0190	
0200	
0210	
0220	
0230	
0240	
0250	
0260	
0270	
0280	
0290	
0300	

COMMISSION IMPLEMENTING REGULATION (EU) 2024/3117
of 29 November 2024
laying down implementing technical standards for the application of Regulation (EU) No 575/2013 of
the European Parliament and of the Council with regard to supervisory reporting of institutions and
repealing Commission Implementing Regulation (EU) 2021/451
(Text with EEA relevance)

ANNEX V		
INSTRUCTIONS FOR REPORTING ON FINANCIAL INFORMATION		
ECB/2013/33 Annex 2, Part		
Balance sheet items		
0240 Tax liabilities	IAS 1.54(n-g)	
0250 Current tax liabilities	IAS 1.54(n); IAS 12.5	
0260 Deferred tax liabilities	Accounting Directive art 17(1)(f); IAS 1.54(o); IAS 12.5; CRR art 4(1)(108)	
0270 Share capital repayable on demand	IAS 12.12.33; IFRIC 2; Annex V, Part 2.12	
0280 Other liabilities	Annex V, Part 2.13	
0290 Liabilities included in disposal groups classified as held for sale	Annex V, Part 2.13	
0295 Liabilities for trading liabilities at fair value	IAS 1.54 (p); IFRS 5.38; Annex V, Part 2.14	
0300 TOTAL LIABILITIES	Annex V, Part 1.29	

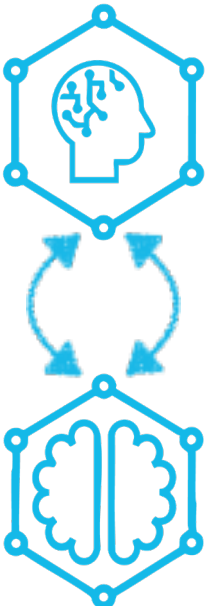
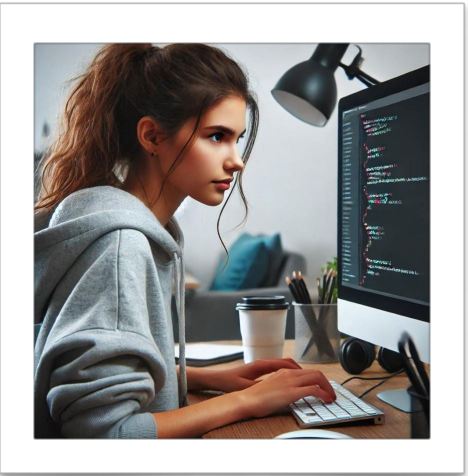
57. 'Share capital repayable on demand' shall include the capital instruments issued by the institution that do not meet the criteria to be classified in equity. Institutions shall include in this item the cooperative shares that do not meet the criteria to be classified in equity

0160 Fair value changes of the hedged items in portfolio hedge of interest rate risk
0170 Provisions
0180 Pensions and other post employment defined benefit obligations
0190 Other long term employee benefits
0200 Restructuring
0210 Pending legal issues and tax litigation
0220 Commitments and guarantees given
0230 Other provisions
0240 Tax liabilities
0250 Current tax liabilities
0260 Deferred tax liabilities
0270 Share capital repayable on demand
0280 Other liabilities
0290 Liabilities included in disposal groups class
0300 TOTAL LIABILITIES



Examples 6 and 10	43
IFRS 9.4.2.1(c), (d), 9.5.5, 9.82.5; IAS 37, IFRS 4, Annex	9
	12

DIRECTIVES
DIRECTIVE 2013/36/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL
of 26 June 2013
on access to the activity of credit institutions and the prudential supervision of credit institutions
and investment firms, amending Directive 2002/87/EC and repealing Directives 2006/48/EC and
2006/49/EC





HYBRID AI IN ACCOUNTING REPORTING: FINREP

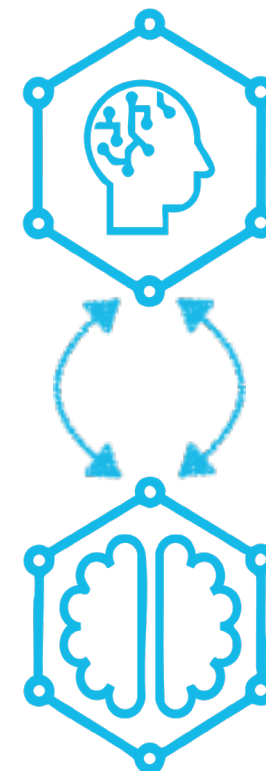
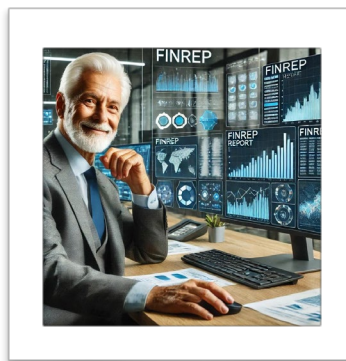
share capital repayable on demand

Please Bilateral AI,
could you read all the documentation
to be compliant with FINREP
with regard to the concept
“share capital repayable on demand”

....

ShareCapitalRepayableOnDemand (x) :-
CapitalInstrument (x), Issued (x), \neg Equity (x).

ShareCapitalRepayableOnDemand (x) :-
CooperativeShare (x), \neg Equity (x).

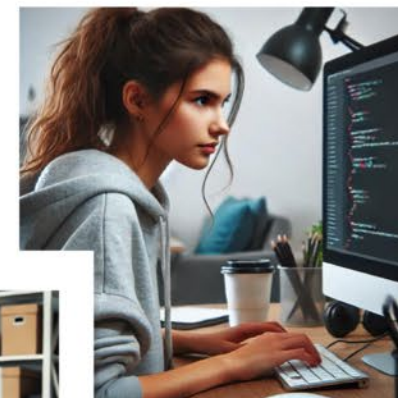




HYBRID AI IN ACCOUNTING REPORTING

HYBRID AI OUTCOMES

- quasi-zero coding approach
- explainable by design
- inspectable
- handle alignment risks
- inclusive
- human in the loop
- factuality
- chatbot/data retrieval vs real-world tasks
- cost-effective
- scalability
- flexible to amendments





THANKS FOR YOUR ATTENTION



Knowledge Graph Lab



BANCA D'ITALIA
EUROSISTEMA

AI made in Austria: Kick-off Meeting of the FWF-funded Cluster of Excellence "Bilateral AI"

On February 26, 2025, around 300 researchers, industry professionals, and decision makers gathered at Johannes Kepler University Linz (JKU) to discuss the project's vision and goals. Two Vice Rectors of TU Wien, Peter Ertl (Vice Rector Research, Innovation, International Affairs) and Wolfgang Kastner (Vice Rector Digitalization and Infrastructure), attended the event, as did Gerti Kappel, Dean of TU Wien Informatics.



CENTRAL BANKING

Economics Fintech Governance Reserves Directory Benchmarking Training Events Awards

Central Banking Awards press release | Fintech Benchmarks 2025 report | Fernando Restoy interview | Revamped Central Bank

Risk manager: Bank of Italy

New credit assessment, corporate mapping and climate tools have helped to bolster risk oversight



The Central Banking Awards

Fabio Panetta, Governor, Bank of Italy, said:



Fabio Panetta

"I am very proud of this prestigious recognition from Central Banking. The Risk manager of the year award honours our unwavering commitment to prudent, forward-looking risk management. It also highlights our key role in supporting the financial system when, in times of crisis, other market participants engage in widespread de-risking."

Since the outbreak of the pandemic, banks around the world have faced large-scale asset price

Measured using credit default swaps, that financial risk has grown at the same rate as balance sheets, since rating agencies tend to look at the average probability of default of issuers over time.



Office of Science and Technology Policy

...mentioned in a [technology report](#) by the White House ([Office of Science and Technology Policy](#)) as a "key innovator in the European Financial Knowledge Graph Space". Such report is a step for the White House to defining a strategy to "power 21st century data science and next-generation Artificial Intelligence". The Team was explicitly mentioned with reference to its Knowledge Graphs track and to the ability to consistently disseminate its AI/CS research in academic venues...