

WHEN CARBON MEETS SQL

Lessons From The World of ESG Data

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WHAT IS ESG AND WHY IS IT IMPORTANT

ENVIRONMENTAL, SOCIAL, GOVERNANCE

- Framework for evaluating how responsibly and sustainably a company operates
- Goes beyond financial metrics and looks at how a company impacts the world

ESG IN INVESTMENT COMPANIES

- Support for operational needs (fund managers) and decision-making
- Compliance with regulations (EU countries)
- Risk assessment strategy: analysis of sustainability metrics for the assets the company invests in



PORTFOLIO EXAMPLE

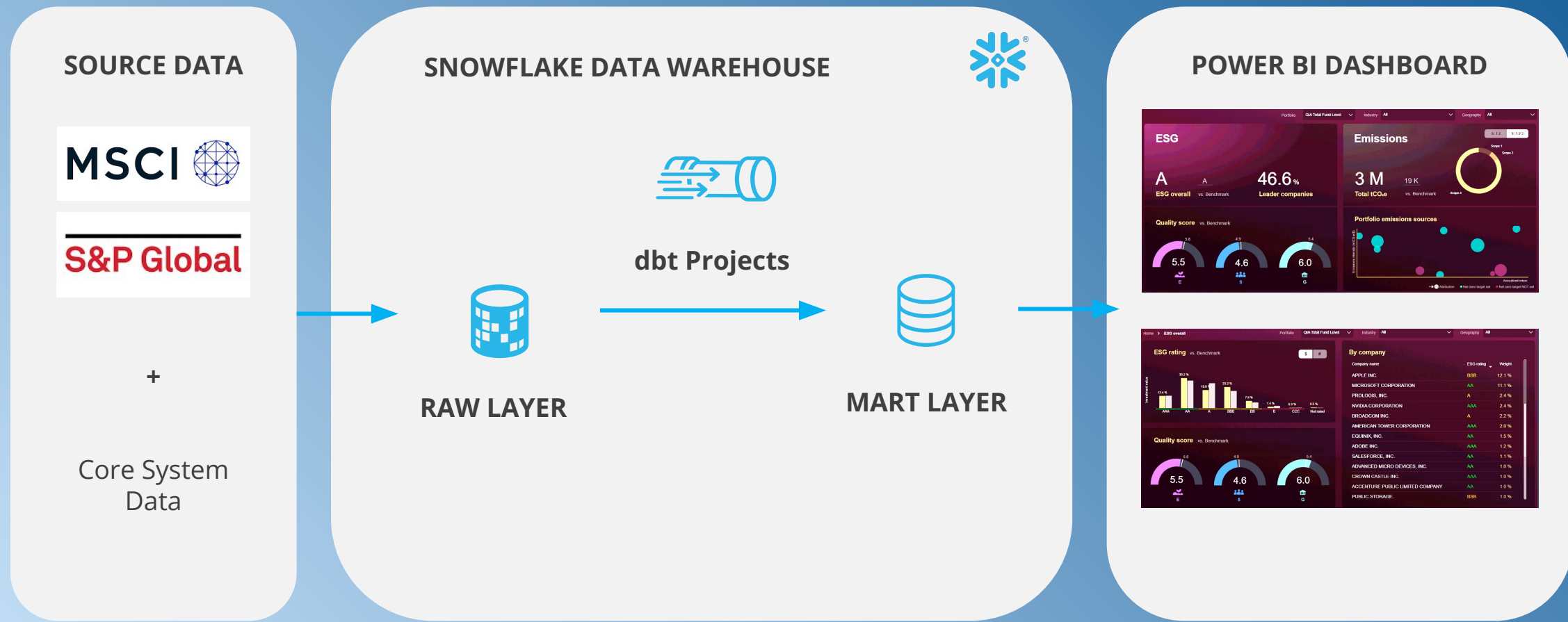
Corporate bonds and equities

- Portfolio consists of financial instruments by corporate issuers (companies)
- Companies report on metrics such as:
 - greenhouse gas emissions
 - % of revenue from coal mining
 - good governance: anti child labor commitment, % of female board members, whistleblower protection
 - etc.

Government bonds

- Portfolio consists of government issued financial instruments – issuer is a country
- Countries are ranked by metrics such as:
 - greenhouse gas intensity rank
 - press freedom rank
 - corruption perception index rank
 - etc.

DATA FLOW



SOURCE DATA



+

Core System Data

SNOWFLAKE DATA WAREHOUSE



dbt Projects

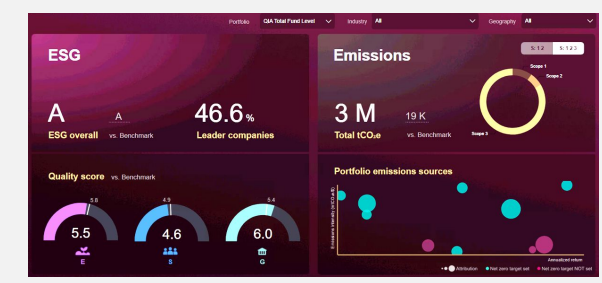


RAW LAYER



MART LAYER

POWER BI DASHBOARD



ESG rating vs. Benchmark: AAA, AA, A, BBB, BB, B, CCC, Not rated

Quality score vs. Benchmark: 5.5, 4.6, 6.0

Company name	ESG rating	Weight
APPLE INC.	BBB	13.1%
MICROSOFT CORPORATION	AA	11.4%
PROLOGIS, INC.	A	2.4%
NVIDIA CORPORATION	AAA	2.4%
BROADCOM INC.	A	2.2%
AMERICAN TOWER CORPORATION	AAA	2.0%
EQUINIX, INC.	AA	1.5%
ADOBX INC.	AAA	1.2%
SALESFORCE, INC.	AA	1.1%
ADVANCED MICRO DEVICES, INC.	AA	1.0%
CROWN CASTLE, INC.	AAA	1.0%
ACENTURE PUBLIC LIMITED COMPANY	AA	1.0%
PUBLIC STORAGE	BBB	1.0%



LESSON #1

DON'T TRUST THE SOURCE TO KEEP YOUR HISTORY

ESG reports must be reproducible - if a report is rerun for a past period, it must show exactly what was known at that time.

Sources from providers like MSCI or SPG are sometimes update only.

Our solution

A pipeline which materializes history daily using Snowflake procedures and tasks.



LESSON #2

SOURCE DATA CAN BE MESSY...

What's supposed to happen

Each stock should consistently belong to the same company (exceptions are possible but not ones like this case).

ID	INSTRUMENT_ID	ISSUER_ID	PUBLICATION_DATE	IVA_COMPANY_RATING	INDUSTRY_ADJUSTED_SCORE	ENVIRONMENTAL_PILLAR_SCORE
1	AB69608A1088	05026299	2025-10-15	BB	3.30	5.70
2	AB69608A1088	02144589	2025-09-30	null	null	null
3	AB69608A1088	05026299	2025-04-30	BB	3.30	5.70

What actually happened

In the data, the same stock ID is suddenly linked to a different company at one point in time and that different company has completely different scores and that change is then reverted.



LESSON #3

... THAT IS WHY TESTS ARE IMPORTANT

Leverage DBT Projects inside Snowflake to test SQL transformations



Catch outliers early in the pipeline before they reach the final report

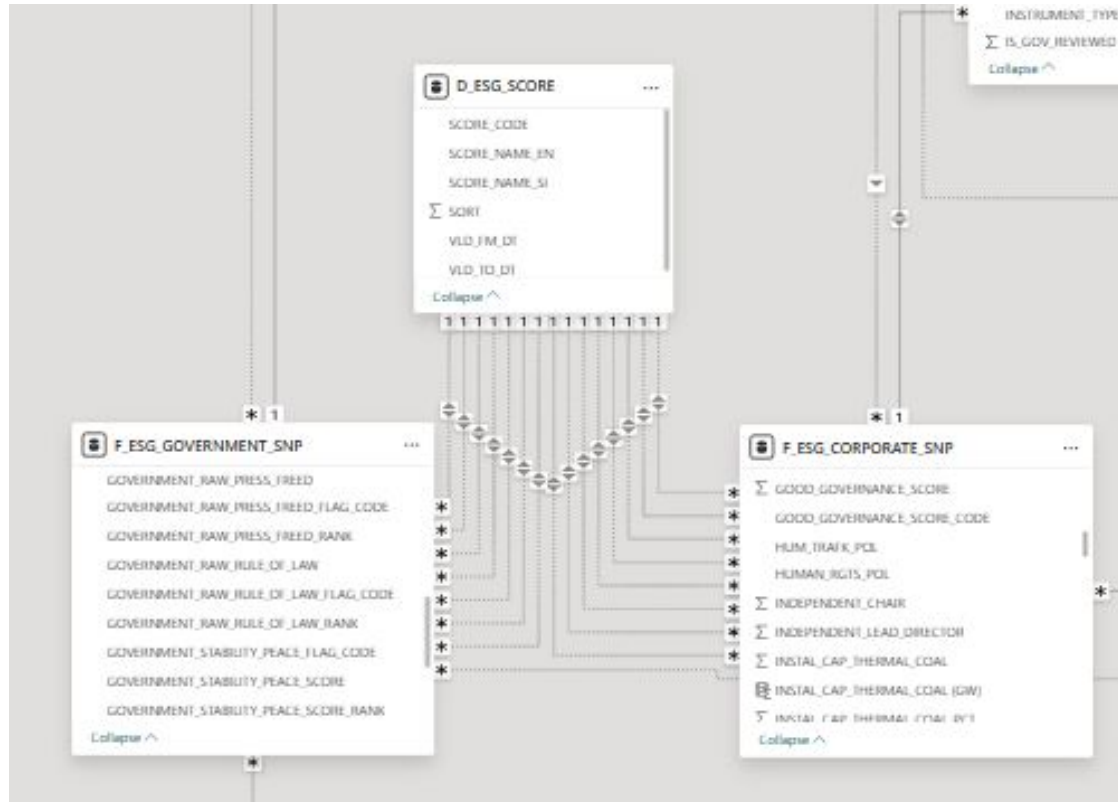


Build trust in data quality with end users



LESSON #4

POWER BI AND KIMBALL, A LOVE-HATE RELATIONSHIP



What then happened in Power BI

- Multiple inactive relationships
- Heavy use of USERELATIONSHIP()
- Lots of DAX measures
- More complex maintenance of the semantic model

LESSON #5

HANDLE COMPLEX FORMULAS IN SQL, NOT DAX

Complex formulas written in DAX are hard to debug, hard to explain and hard to document.

Power BI / DAX

- Logic evaluated at query time
- Intermediate results not visible
- Sensitive to filter context
- Limited commenting and testing

Snowflake / SQL

- Step-by-step transformations
- Each step explicitly named
- Easy to validate intermediate results
- Clear comments and documentation

Even though we now have a couple more lines of SQL, the transformations are clear, documented and easy to test.



THANK YOU FOR LISTENING!

QUESTIONS?



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