

Exploring Large Language Models to analyse XBRL reports

Food for thought !

32nd XBRL Europe Conference, Malta

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-
1. Interactive Dashboard
 2. LLMs for Fundamental Analysis
 3. Narrative Disclosure Analysis using LLM
 4. Do LLMs better interpret XBRL?

Primarily Use Case

To demonstrate how regulators can use XBRL data for compliance monitoring, enforcement and oversight.

Fundamental Analysis with Interactive Dashboard

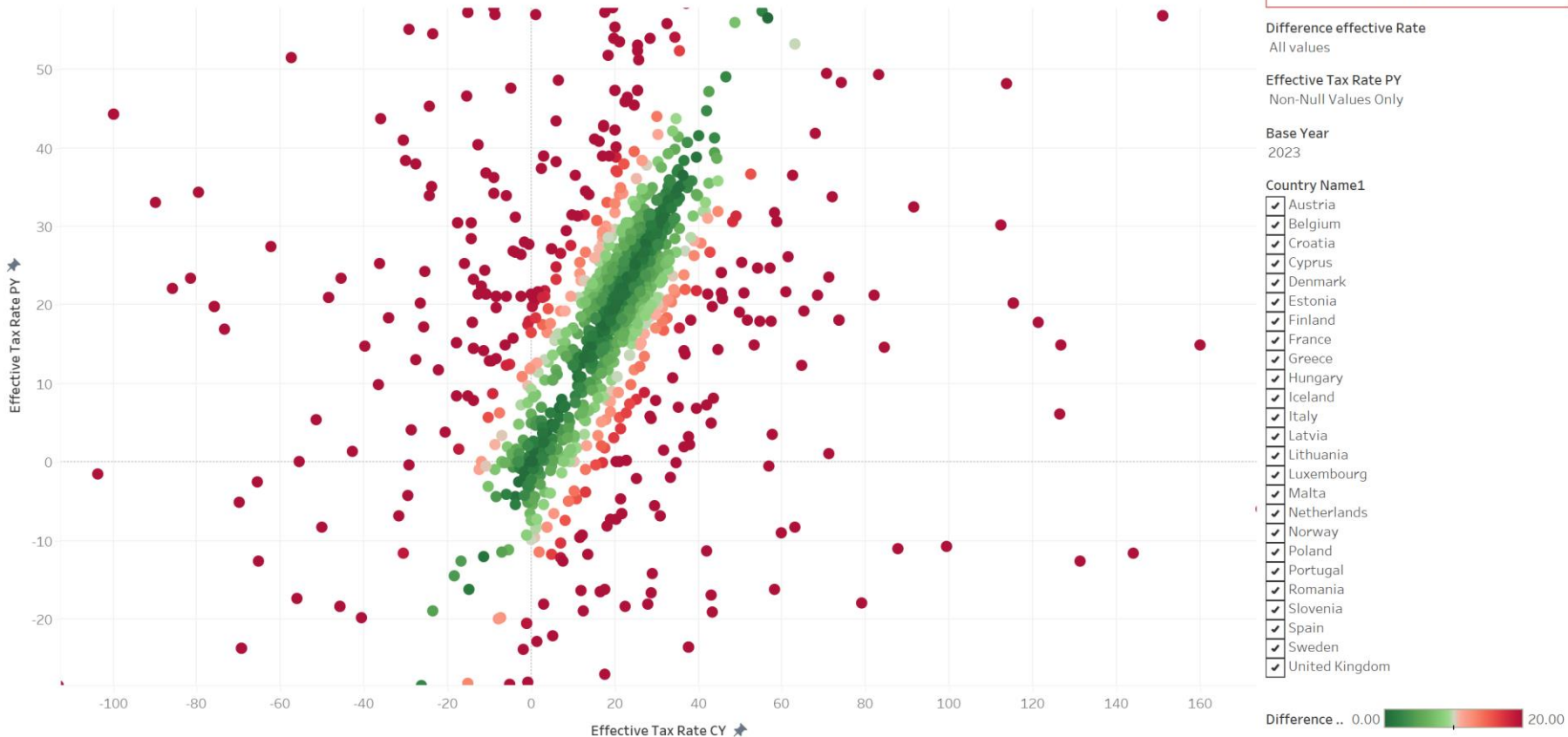
Objective:

Analysis using interactive dashboards set-up from face financial data to identify patterns and outliers.

Interactive Dashboard

Effective Tax Rate

Effective Tax Rate Changes



Main Dashboard

Difference effective Rate
All values

Effective Tax Rate PY
Non-Null Values Only

Base Year
2023

Country Name1

- Austria
- Belgium
- Croatia
- Cyprus
- Denmark
- Estonia
- Finland
- France
- Greece
- Hungary
- Iceland
- Italy
- Latvia
- Lithuania
- Luxembourg
- Malta
- Netherlands
- Norway
- Poland
- Portugal
- Romania
- Slovenia
- Spain
- Sweden
- United Kingdom

Difference .. 0.00 20.00

ESEF Report Transformation

ESEF reports to analytics

ESEF
iXBRL Report

Source: filings.xbrl.org

Converted to
xBRL-JSON

Transformation

Analytical Tool

Load in GPT4

Understood by programming languages & analytical software

- Normalised the currencies
- Filtering for Numeric Data
- Converted to a consolidated dataset



Scan to access the ESEF dashboard

Fundamental Analysis with GPT-4

Objective:

The purpose of this presentation is to explore how well LLMs can consume and analyse XBRL data at scale

Using simple English language to query fundamental data for across reports

- *Use case 1 – Identify exceptions among companies that are losing money.*
- *Use case 2 – Categorise companies by their Leverage Ratios to examine trends.*

Fundamental Analysis with LLM

Outliers - Loss Making



You

List the bottom 10 companies with lowest profit growth in 2023 as compared to 2022

4. **Carlsberg Breweries A/S**: -1,933.39% growth
5. **Remedy Entertainment Oyj**: -1,212.69% growth
6. **Gecina**: -1,170.91% growth
7. **Oriola Oyj**: -762.50% growth (listed twice, possibly due to different reports)

These entries indicate substantial losses or reductions in profits compared to the previous year. If you need a deeper analysis of these results or additional details about specific companies, feel free to ask! [>-]

Fundamental Analysis with LLM

Drill down to the report

CARLSBERG A/S filing
to Virk for period
ending 31 Dec 2023

INCOME STATEMENT

DKK million	Section	2023	2022
Revenue	1.1	73,585	70,265
Cost of sales	1.2.1	40,753	-38,198
Gross profit		32,832	32,067
Sales and distribution expenses	1.2.2	-18,355	-17,337
Administrative expenses		-4,077	-4,229
Other operating activities, net	1.2.3	124	68
Share of profit after tax of associates	5.5	581	901
Operating profit before special items		11,105	11,470
Special items, net	3.1	-431	-784
Financial income	4.1	695	347
Financial expenses	4.1	-1,539	-1,072
Profit before tax		9,830	9,961
Income tax	6.1	-1,859	-1,778
Profit from continuing operations		7,971	8,183
Loss from discontinued operations ¹	5.1	-47,748	-8,075
Profit for the period		-39,777	108
Attributable to			
Non-controlling interests	1.1	1,011	1,171
Shareholders in Carlsberg A/S (net profit)		-40,788	-1,063
DKK			
Earnings per share			
	8.1		
Earnings per share of DKK 20 (EPS)		-299.7	-7.6
Continuing operations		51.1	50.1
Discontinued operations		-350.8	-57.7
Diluted earnings per share of DKK 20 (EPS-D)		-299.7	-7.6
Continuing operations		51.0	50.0
Discontinued operations		-350.8	-57.7

¹ The discontinued operation in Russia was deconsolidated as of July 2023, cf. section 5.1

STATEMENT OF COMPREHENSIVE INCOME

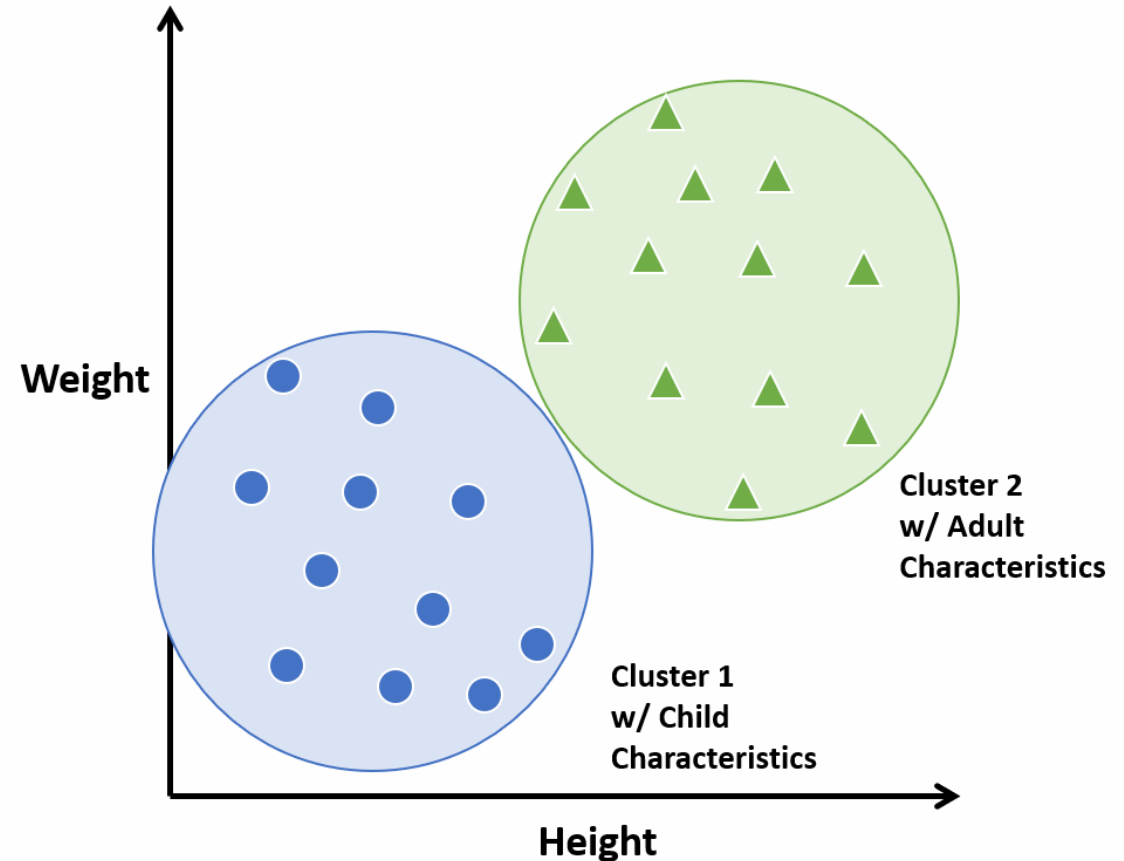
DKK million	Section	2023	2022
Profit for the period		-39,777	108
Other comprehensive income			
Retirement benefit obligations	7.4	-73	586
Income tax	6.1	-28	-73
Items that will not be reclassified to the income statement		-101	513
Foreign exchange adjustments of foreign entities	4.1	37,781	-3,926
Fair value adjustments of hedging instruments	4.1	920	-759
Income tax	6.1	-44	100
Items that will be reclassified to the income statement		38,657	-4,585
Other comprehensive income		38,556	-4,072
Total comprehensive income		-1,221	-3,964
Attributable to			
Non-controlling interests		753	603
Shareholders in Carlsberg A/S		-1,974	-4,567
Total comprehensive income for the period arises from			
Continuing operations		6,297	6,944
Discontinued operations		-7,518	-10,908
Total comprehensive income		-1,221	-3,964

Clustering Analysis with LLM

Clustering

- Clustering
 - Group based on properties
- Financial analysis to find
 - Similar companies
 - Spot outliers
- How to do clustering
 - Use a clustering algorithm library
 - (some code)!

With LLM this process this much easier!



Source - <https://www.analyticsvidhya.com/blog/2021/05/what-why-and-how-of-spectral-clustering/>

Clustering with LLM

Leverage Analysis



You

Cluster companies based on "Asset-to-Equity Ratio". Create 5 clusters. Provide examples of companies that appear within each cluster.

snapshot of ea
with the cluste
Here are exam
Ratio":

Cluster 0 (Moderate Leverage)

Cluster 2 (High but less extreme leverage)

- **Lloyds Bank PLC**: Ratio = 14.97
- **Finnvera Oyj**: Ratio = 10.73
- **Alisa Pankki Oyj**: Ratio = 11.96

Cluster 3 (Negative Leverage)

- **Elenia Verkko Oyj**: Ratio = -84.55

Cluster 4 (Extremely High Leverage)

- **St. James's Place PLC**: Ratio = 175.18

These clusters reflect a range from moderate to extremely high leverage, including a negative leverage category indicating financial distress. If you need more information about specific clusters or further analysis, let me know! ↴



Let's start

Equity

Clustering with LLM

Exploring a cluster

Most in the clusters are Banks with high leverage which is reasonable, but there are outliers as well!

A lot of financial numbers or combination can be used for clustering – options to explore !

1. Coventry Building Society
2. HSBC UK Bank PLC
3. Barclays PLC
4. Lloyds Bank Corporate Markets PLC
5. HBOS PLC
6. ING Bank N.V.
7. Nordea Bank Abp
8. Banco Santander, S.A.
9. Suomen Hypoteekkiyhdistys
10. BidCo RelyOn Nutec A/S
11. TDC NET Holding A/S
12. ING Groep N.V.
13. Lloyds Banking Group PLC
14. TDC NET A/S
15. Bank of Ireland Group PLC
16. Permanent TSB Group Holdings PLC
17. Unibet-Rodamco-Westfield N.V.
18. de Volksbank N.V.
19. Van Lanschot Kempen N.V.
20. PostNL N.V.
21. OP Osuuskahta
22. Ålandsbanken Abp
23. Aktia Bank Abp
24. Oma Säästöpankki Oyj
25. Finnvera Oyj
26. Alisa Pankki Oyj
27. International Consolidated Airlines Group, S.A.
28. Raiffeisen Bank International AG
29. NIBC Bank N.V.
30. ABN AMRO Bank N.V.
31. Coöperatieve Rabobank U.A.
32. HSBC Continental Europe
33. AXA
34. Barclays Bank PLC
35. Lloyds Bank PLC
36. Natixis
37. HSBC Bank PLC
38. Societe Generale
39. Bank of Scotland PLC
40. Santander UK PLC
41. The Governor and Company of the Bank of Ireland
42. Kommunalkredit Austria AG
43. BNP Paribas
44. Standard Chartered Bank
45. NatWest Markets PLC
46. Standard Chartered PLC

Fundamental Analysis with LLM

Empowering business users

- Fundamental Analysis using GPT opens up a lot of opportunities
- Exploring aspects beyond the pre-configured views
- Empowers business user



Narrative Disclosure Analysis with GPT-4

Objective:

Insights from narrative disclosure using large language model

- *Use case 1 – Identify if there are any change in narrative text as compared to last year*
- *Use case 2 – Spot outliers in “Going Concern” across companies for further analysis*
- *Use case 3 - How objective are the ESG mitigation disclosures*

Narrative comparison YOY

Has there been any substantial change?

- Narrative disclosures like accounting policy are static
- Any meaningful changes might be worth to note

(H) TRADE AND OTHER PAYABLES

Trade and other payables are classified as current liabilities if payment is due within one year or less from the end of the current accounting period. If not, they are presented as non-current liabilities. Trade and other payables are recognised initially at their fair value and subsequently measured at amortised cost using the effective interest method until settled.

(I) SEGMENTAL REPORTING

The Chief Operating Decision Maker (the "CODM") being the Board of Directors, is of the opinion that the Company is engaged in a single segment of business, being investment in digital infrastructure projects.

The internal financial information to be used by the CODM on a quarterly basis to allocate resources, assess performance and manage the Company will present the business as a single segment comprising the portfolio of investments in digital infrastructure assets.

(J) FOREIGN CURRENCY TRANSACTIONS AND BALANCES

Transactions in foreign currencies are translated at the foreign exchange rate ruling at the date of the transaction. Monetary assets and liabilities denominated in foreign currencies at the reporting date are translated at the foreign exchange rate ruling at that date. Foreign exchange differences arising on translation are recognised in the Statement of Comprehensive Income as a revenue or capital item depending on the income or expense to which they relate.

All exchange differences recognised in income or expenses, except for those arising on financial instruments measured at fair value through profit or loss in accordance with IFRS 9, is on an aggregate net basis. The total amount of exchange differences recognised in income or expenses includes exchange differences recognised on subsequent settlement and re-translation to the closing rate on balances arising from foreign currency transactions.

(K) REVENUE RECOGNITION

Gains and losses on fair value of investments in the Statement of Comprehensive Income will represent gains or losses that arise from the movement in the fair value of the Company's investment in D9 Holdco.

Investment income comprises dividend income received from the Company's subsidiary. Interest income is recognised in the Statement of Comprehensive Income using the effective interest method.

Other income is recognised to the extent that the economic benefits will flow to the Company and the income can be reliably measured. Income is measured as the fair value of consideration

received or receivable, excluding discounts, rebates and value added tax. Other Income comprises fees charged to Investee Companies under a Management Services Agreement. Other Income is recognised 100% through revenue.

Dividend income receivable on equity shares is recognised on the ex-dividend date. Dividend income on equity shares where no ex-dividend date is quoted is brought into account when the Company's right to receive payment is established.

(L) DIVIDENDS

Dividends payable are recognised as distribution in the financial statements in the period in which they are paid or when the Company's obligation to make payment has been established.

(M) FUND EXPENSES

Expenses are accounted for on an accruals basis. Share issue costs of the Company directly attributable to the issue and listing of shares are charged to stated capital. The Company's investment management fee, administration fees and all other expenses are charged through the Statement of Comprehensive Income.

In order to better reflect the activities of an investment trust company and in accordance with guidance issued by the AIC SORP, supplementary information which analyses the Statement of Comprehensive Income between items of a revenue and a capital nature has been presented alongside the Statement of Comprehensive Income.

Expenses have been charged wholly to the revenue column of the Statement of Comprehensive Income, except as follows:

- expenses which are incidental to the acquisition or disposal of an investment are treated as capital;
- expenses are treated as capital where a connection with the maintenance or enhancement of the value of the investments can be demonstrated; and
- the investment management fee has been allocated 75% to revenue and 25% to capital on the Statement of Comprehensive Income in line with the Board's expected long-term split of returns, in the form of income and capital gains respectively, from the investment portfolio.

(N) ACQUISITION COSTS AND DISPOSALS

In line with SORP, acquisition costs and disposals are expensed to the capital column of the Statement of Comprehensive Income as they are incurred for investments which are held at fair value through profit or loss.

Source: <https://filings.xbrl.org/2138000QLX64UNS38U92/2023-12-31/ESEF/GB/0/2138000QLX64UNS38U92-2023-12-31/reports/ixbrlviewer.html>

Narrative comparison YOY

Has there been any substantial change?

Data –
2 ESEF report of consecutive years in xBRL-JSON format.

For these concepts, find if the text values have changed from 2022 and state if there are significant changes:

1. `ifrs-full:DescriptionOfAccountingPolicyForFinancialAssetsExplanatory`
2. `ifrs-full:DescriptionOfAccountingPolicyForFinancialInstrumentsExplanatory`
3. `ifrs-full:DescriptionOfAccountingPolicyForDerecognitionOfFinancialInstrumentsExplanatory`
4. `ifrs-full:DescriptionOfAccountingPolicyForFinancialLiabilitiesExplanatory`
5. `ifrs-full:DescriptionOfAccountingPolicyForFairValueMeasurementExplanatory`
6. `ifrs-full:DescriptionOfAccountingPolicyForDerivativeFinancialInstrumentsAndHedgingExplanatory`
7. `ifrs-full:DescriptionOfAccountingPolicyForDerivativeFinancialInstrumentsExplanatory`
8. `ifrs-full:DescriptionOfAccountingPolicyForHedgingExplanatory`
9. `ifrs-full:DescriptionOfAccountingPolicyForDeferredIncomeTaxExplanatory`
10. `ifrs-full:DescriptionOfAccountingPolicyForIncomeTaxExplanatory`
11. `ifrs-full:DescriptionOfAccountingPolicyForInvestmentInAssociatesAndJointVenturesExplanatory`
12. `ifrs-full:DescriptionOfAccountingPolicyForInvestmentInAssociates`
13. `ifrs-full:DescriptionOfAccountingPolicyToDetermineComponentsOfCashAndCashEquivalents`

Narrative comparison YOY

Has there been any substantial change?

Trying to do its best with HTML tag

Reminder HTML styling is discarded automated analysis



Data Analyst

Great, you've provided a list of concepts for which you'd like to check for text changes between the fiscal years 2022 and 2023. I will load both the 2022 and 2023 xBRL-JSON files and extract the text for these specific concepts, then compare them to see if there have been any changes.

Let's proceed with loading the content from both files.

The output indicates that the content is quite large and complex, with many HTML-like noise within the text. It also appears that the output was truncated due to its size. To handle this, I'll perform the text comparison in parts and process the content to remove any HTML-like elements for clarity.

Let's start by removing the HTML noise from the facts for each concept from both years and then we will compare them to see if there are any changes. [>-]

Narrative comparison YOY

Results

Company 1
(Nestle):
No change

Company 1 (Nestle)	Company 2 (ASCENTIAL PLC)
<p>Changes and Significance for Specified Concepts</p> <ol style="list-style-type: none">Description of Accounting Policy for Financial Assets Explanatory<ul style="list-style-type: none">Change detected: No significant change.Description of Accounting Policy for Financial Instruments Explanatory<ul style="list-style-type: none">Change detected: No significant change.Description of Accounting Policy for Derecognition of Financial Instruments Explanatory<ul style="list-style-type: none">No change detected: No significant change.Description of Accounting Policy for Financial Liabilities Explanatory<ul style="list-style-type: none">No change detected: No significant change.Description of Accounting Policy for Fair Value Measurement Explanatory<ul style="list-style-type: none">No change detected: No significant change.Description of Accounting Policy for Derivative Financial Instruments and Hedging Explanatory<ul style="list-style-type: none">No change detected: No significant change.Description of Accounting Policy for Derivative Financial Instruments Explanatory<ul style="list-style-type: none">No change detected: No significant change.Description of Accounting Policy for Hedging Explanatory<ul style="list-style-type: none">No change detected: No significant change.	<p>Minor difference + new policy related to Environmental related expenses</p>

Company 2 (ASCENTIAL PLC):
Minor difference + new policy related to Environmental related expenses

DescriptionOfAccountingPolicyForGoodwillExplanatory:
22: Goodwill allocation and impairment review process.
23: Similar content with minor adjustments.

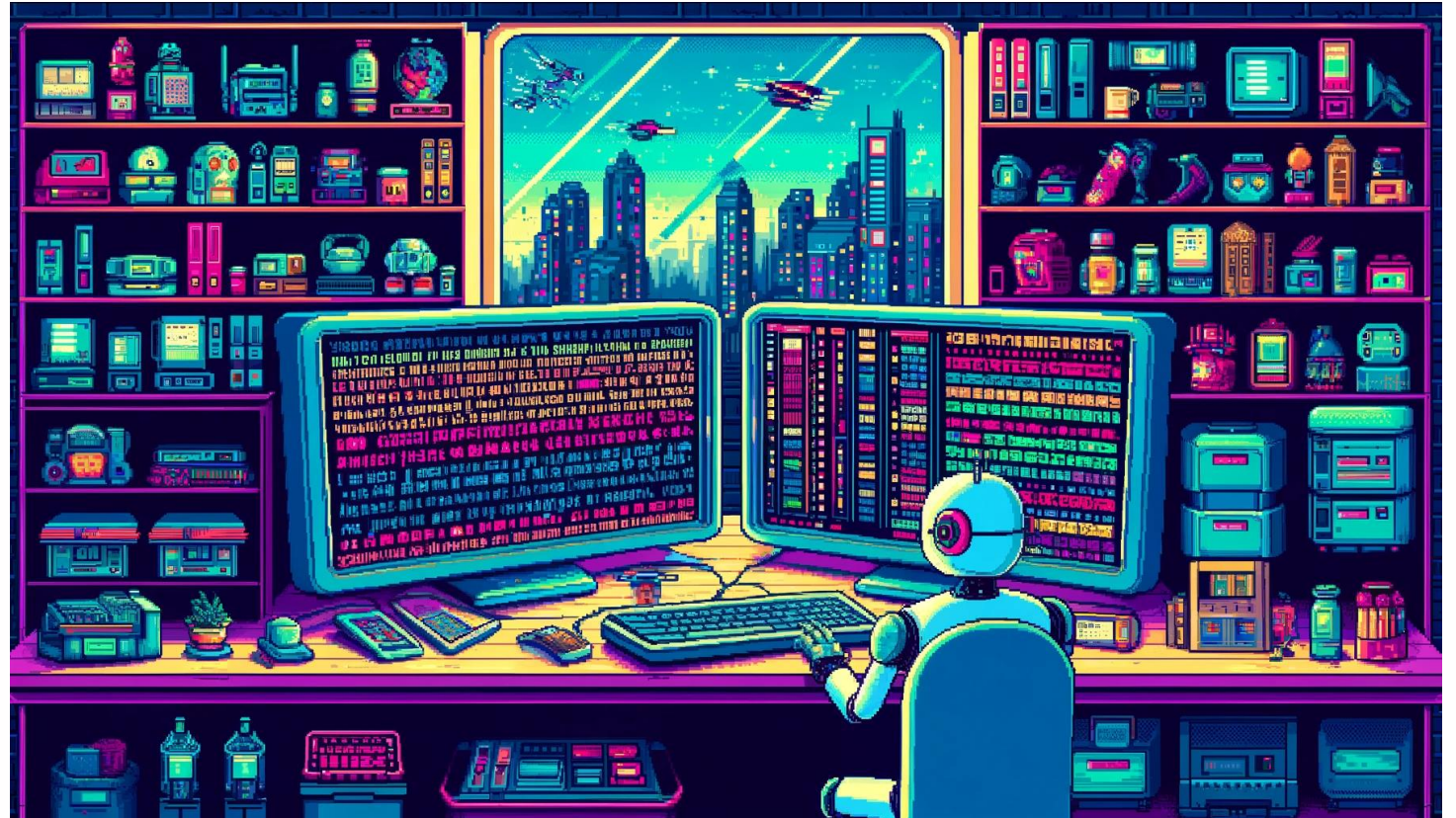
DescriptionOfAccountingPolicyForEnvironmentRelatedExpenseExplanatory:
Not specifically highlighted.
Factors affecting accounting estimates and judgments are noted, but specifics are tailed.

Narrative comparison YOY

Easy comparison

Narrative disclosure comparison

- Useful insight
- A simple language query
- without coding



Patterns in Narrative across companies

Does narrative disclosure provide any clue

- Thematic analysis of specific disclosure
- Compare the narrative across companies
- Pattern / Similarity/Outliers
- TF-IDF scores for narrative text

A combined score -

- *How many words?*
- *Frequency of words?*
- *How rare is the word?*

TF-IDF

TF-IDF is a measure of originality of a word by comparing the number of times a word appears in a doc with the number of docs the word appears in.

$$\text{TF-IDF} = \text{TF}(t, d) \times \text{IDF}(t)$$

Term frequency

Inverse document frequency

Number of times term t appears in a doc, d

$\log \frac{1 + n}{1 + \text{df}(d, t)}$

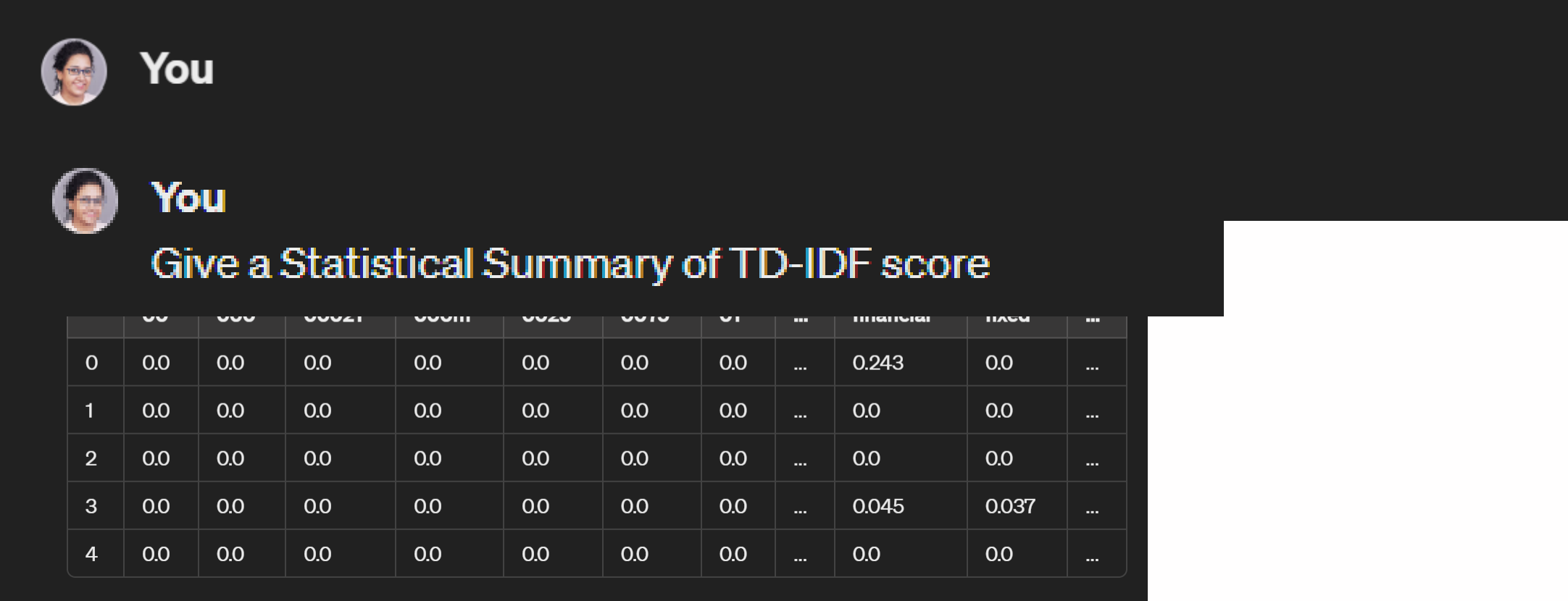
of documents

Document frequency of the term t

Source - <https://medium.com/analytics-vidhya/demonstrating-calculation-of-tf-idf-from-sklearn-4f9526e7e78b>

Patterns in Narrative across companies

Data – Going Concern disclosures from 184 ESEF reports




The screenshot shows a chat window with a dark background. At the top left, there is a circular profile picture of a woman with glasses and the name "You". Below this, another instance of the same profile picture and name "You" is shown. The main message in the chat reads "Give a Statistical Summary of TD-IDF score". Below the message is a table with 12 columns and 5 rows of data.

	00	000	0021	00311	0020	0070	01	...	financial	taxes	...
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	...	0.243	0.0	...
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	...	0.0	0.0	...
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	...	0.0	0.0	...
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	...	0.045	0.037	...
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	...	0.0	0.0	...

Patterns in 'Going Concern' disclosure

Distribution of TF-IDF scores

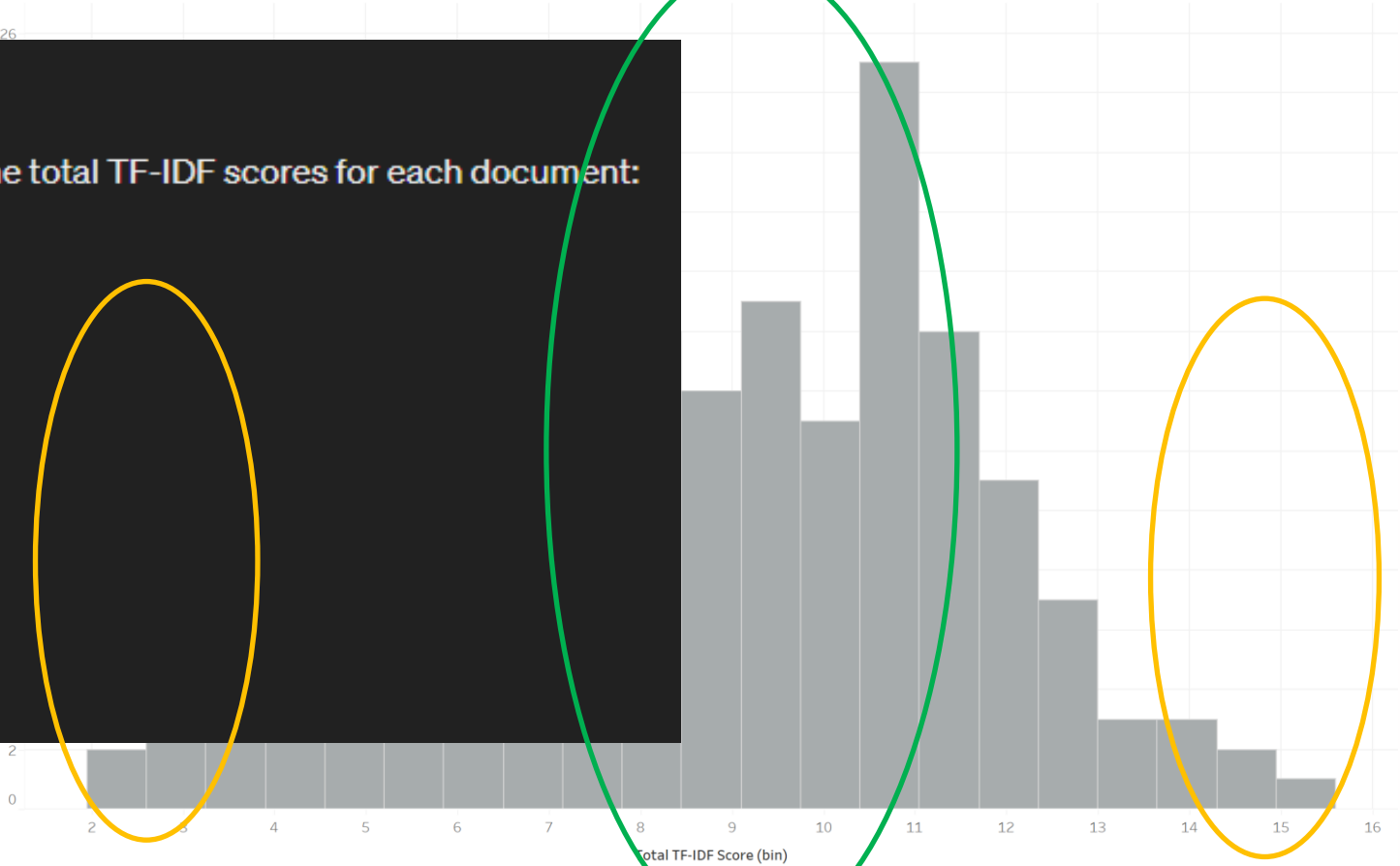
Going Concer Dislcoure | TD-IDF scores
184 ESEF reports

 **ChatGPT**

Here's a statistical summary of the total TF-IDF scores for each document:

High TF-IDF scores means they have used more words & unique words than the rest

- ▶ **Count:** 184 documents
- ▶ **Mean:** 8.99
- ▶ **Standard Deviation:** 2.79
- ▶ **Minimum:** 2.19
- ▶ **25th Percentile:** 7.17
- ▶ **Median (50th Percentile):** 9.34
- ▶ **75th Percentile:** 10.95
- ▶ **Maximum:** 15.10



Patterns in 'Going Concern' disclosure

Sample disclosure text

Extract of typical 'Going Concern' disclosure - (TF-IDF scores - 8.9)

GOING CONCERN

The Directors have reviewed the historical trading performance of the Group and the forecasts through to March 2025.

The Directors, in their detailed consideration of going concern, have considered the Group's future revenue projections and cash requirements, which they believe are based on prudent interpretations of market data and past experience.

The Directors have also considered the Group's level of available liquidity under its financing facilities. The Directors have carried out a robust assessment of the significant risks currently facing the Group. This has included consideration of the implications of further inflation and the potential impact of lower sales volumes from reduced consumer demand in response to increasing retail prices.

Having taken these factors into account under the scenario, which is considered to be severe but plausible, the Directors consider that adequate headroom is available based on the forecasted cash requirements of the Group. At the date of this report, the Group has complied in all respects with the terms of its borrowing agreements, including its financial covenants, and forecasts to continue to do so in the future.

Consequently, the Directors consider that the Group has adequate resources to meet its liabilities as they fall due for the foreseeable future. For this reason, they continue to adopt the going concern basis in preparing the Financial Statements.

BAKKAVOR GROUP PLC 2023 report

An outlier 'Going Concern' disclosure

TF-IDF scores - 14.6

- Volume dropped by 24%
- Lower Demand
- no sign of recovery

VICTREX PLC 2023 report

GOING CONCERN
The Directors have performed a robust going concern assessment including a detailed review of the business' 24-month rolling forecast and consideration of the principal risks faced by the Group and the Company, as detailed on pages 32 to 38. This assessment has paid particular attention to current trading results and the impact of the current global economic challenges on the aforementioned forecasts.

The Company maintains a strong balance sheet providing assurance to key stakeholders, including customers, suppliers and employees. The combined cash and other financial assets balance at 30 September 2023 was £33.5m, having reduced from £68.8m at 30 September 2022 following payment of the regular dividends of £40.1m in February 2023 and £11.7m in June 2023 and a strategic increase in the level of inventory held. Of the £33.5m, £3.4m is held in the Group's subsidiaries in China for the sole purpose of funding the construction of our new manufacturing facilities. Of the remaining £30.1m, approximately 70% is held in the UK, on instant access, where the Company incurs the majority of its expenditure. The Group has drawn debt of £31.6m in its Chinese subsidiaries (with a total facility of c.£34.2m available until December 2026) and has utilised UK banking facilities, renewed and extended in October 2023, of £60m through to October 2026, of which £40m is committed and immediately available and £20m is available subject to lender approval.

1. Basis of preparation continued
Going concern continued
The 24-month forecast is derived from the Company's Integrated Business Planning ('IBP') process which runs monthly. Each area of the business provides forecasts which consider a number of external data sources, triangulating with customer conversations, trends in market and country indices as well as forward-looking industry forecasts, for example forecast aircraft build rates from the two major manufacturers for Aerospace, rig count and purchasing manager indices for E&I, World Semiconductor Trade Statistics semiconductor market forecasts for Electronics and Needham and IQVIA forecasts for Medical procedures.

The assessment of going concern included conducting scenario analysis on the aforementioned forecast which, given current economic forecasts and sales trends through the financial year ended 30 September 2023, where volumes dropped 24% year on year and 33% in the second half, exacerbated by rapid customer destocking, focused on the Group's ability to sustain a further period of suppressed demand. In assessing the severity of the scenario analysis the scale and longevity of the impact experienced during previous economic downturns have been considered, including the differing impacts on the Sustainable Solutions versus Medical segments.

Using the IBP data and reference points from previous downturns management has created two scenarios to model the continuing effect of lower demand at regional/market level and aggregated levels on the Company's profits and cash generation through to December 2024 which is considered to give a view to 18 months beyond this. The impact of climate change and the Group's Net Zero 2050 goal (Scope 1, 2 & 3) are considered as part of the aforementioned IBP process, from both a revenue and cost perspective, with the anticipated impact (assessed as insignificant over the shorter-term going concern period) incorporated in the forecasts. As a result the scenario testing noted below does not incorporate any additional sensitivity specific to climate change.

During the second half of FY 2023 the drop in sales to a quarterly run rate of c.830 tonnes reflected the continuation of the contraction in demand in the global economy, which started in the first quarter of FY 2023, and also the rapid destocking by customers as they managed their inventory and had extended shutdowns. This level of demand is not inconsistent with that seen during COVID-19 with Q2 and Q4 for 2020 at similar levels and Q3 lower due to global lockdowns. Other than in the current economic cycle and during COVID-19 demand has not been at this level during the past decade. With customers now largely destocked the Board believes the low point of the economic cycle has been reached and, whilst there are limited signs of a return to growth, demand has stabilised. As a result the key downside risk is that of an extended period of subdued demand. The current downturn has been running for 12 months, already longer than the previous downturns during COVID-19 and the financial crisis. The Board has considered the impact of reduced demand, in line with the lowest quarter of the previous year, Q3, for a further 6 months (scenario 1) and a further 12 months (scenario 2). As noted above, the lower cash balance at 30 September 2023 is, apart from lower sales volumes, attributable to an increase in the level of inventory held. Current forecasts assume a gradual reduction in inventory across FY 2024 and FY 2025 with inventory providing the opportunity to benefit from market recovery. The scenarios modelled assume that a more aggressive inventory unwind approach is taken to mitigate the ongoing lower cash generation from subdued volumes.

Scenario 1 – the global economy remains subdued through the first half of FY 2024 with demand in line with the low point in FY 2023, quarter 3, before a slow recovery in the second half of FY 2024. The demand then increases modestly through the second half to c.1,900 tonnes before further modest growth for the remainder of the going concern period. Medical revenue remains in line with that seen during the past 12 months' run rate, with the economic situation historically having minimal impact on this segment, in line with the experience of the past 12 months. Inventory is reduced in line with sales.

Scenario 2 – in line with scenario 1 through the first half of FY 2024, with this lower demand continuing for a further 12 months, i.e. throughout the going concern period, taking the total period of lower demand to in excess of 24 months, well above the duration of any previous downturn experienced by the Company. This would give an annual volume below c.3,300 tonnes, a level not seen since 2013. In this scenario Medical revenue is reduced by 10% during the second six months to reflect a limited impact from a longer lasting slowdown. With the period of prolonged lower demand, a more aggressive unwind of the inventory balance has been assumed. Inventory is reduced in line with sales. The Group considers scenario 2 to be a severe but plausible scenario.

Commercial sales from the new P&EK manufacturing facility in China are expected in early 2024, a consequence of which is that the entity will require additional funding to see it through to net cash generation. In concluding on the going concern position, it has been assumed that Victrex will provide the additional funds in full, which the Board considers to be the worst case scenario.

Before any mitigating actions the sensitised cash flows show the Company has significantly reduced cash headroom, which would require use of the committed facility during the going concern period. The level of facility drawn down is higher in scenario 2 but in neither scenario is the committed facility fully drawn, nor drawn for the whole year. With cash levels lower than has historically been the case for Victrex, the Company has identified a number of mitigating actions which are readily available to increase the headroom. These include:

- use of committed facility – £40m could be drawn at short notice. Conversations with our banking partners indicate that the £20m uncommitted accordion could also be readily accessed. The covenants of the facility have been successfully tested under each of the scenarios;
- deferral of capital expenditure – the base case capital investment over the next 12 months is lower than recent years at approximately £30-£35m with major projects completed in China and the UK. This could be reduced significantly by limiting expenditure to essential projects, deferring all other projects later into 2025 or beyond;
- reduction in discretionary overheads – costs would be limited to prioritise and support customer related activity;
- reduction in inventory levels – inventory has been increased to provide additional security during plant shutdowns and to provide sufficient inventory to respond to a rapid economic recovery. The scenarios noted above include an acceleration of the inventory unwind but a more aggressive approach could be taken to provide additional cash resources; and
- deferral/cancellation of dividends – the Board considers the cash position and interests of all stakeholders before recommending payment of a dividend. A dividend has been proposed for payment in February 2024 of c.£40m and in the past an interim dividend of c.£12m has been paid in June, giving a combined annual outflow of c.£52m.

1. Basis of preparation continued
Going concern continued
Reverse stress testing was performed to identify the level that sales would need to drop by in order for the Group to run out of cash by the end of the going concern assessment period. Sales volumes would need to consistently drop materially below the low point in scenario 2, which is not considered plausible.

As a result of this detailed assessment and with reference to the Company's strong balance sheet, existing committed facilities and the cash preserving levers at the Company's disposal, but also acknowledging the current economic uncertainty with a number of global economies close to/in recession, the war in Ukraine continuing and tensions in the Middle East, the Board has concluded that the Company has sufficient liquidity to meet its obligations when they fall due for a period of at least 12 months after the date of this report. For this reason, they continue to adopt the going concern basis in preparing the financial statements.

Patterns in Narrative disclosure

High TF-IDF and correlations with Fundamental Numbers

- Correlation with Face Financial Data
- Decrease in revenue, profit and cashflow

	Note	2023 £m	2022 £m
Revenue	2	307.0	341.0
Losses on foreign currency net hedging		(7.6)	(2.8)
Cost of sales	3	(136.8)	(163.7)
Gross profit		162.6	174.5
Sales, marketing and administrative expenses	3	(70.8)	(70.3)
Research and development expenses	3	(18.6)	(15.7)
Operating profit before exceptional items		80.7	96.4
Exceptional items	3	(7.5)	(7.9)
Operating profit		73.2	88.5
Finance income	6	1.3	0.5
Finance costs	6	(0.7)	(0.3)
Share of loss of associate	11	(1.3)	(1.0)
Profit before tax and exceptional items		80.0	95.6
Exceptional items	3	(7.5)	(7.9)
Profit before tax		72.5	87.7
Income tax expense	7	(11.5)	(12.2)
Profit for the financial year		61.0	75.5
Profit/(loss) for the year attributable to:			
– Owners of the Company		61.7	76.2
– Non-controlling interests	11	(0.7)	(0.7)
Earnings per share			
Basic	8	70.9p	87.6p
Diluted	8	70.5p	87.3p
Dividend per ordinary share			
Interim	22	13.42p	13.42p
Final	22	46.14p	46.14p
	22	59.56p	59.56p

Patterns in Narrative across companies

Statistical measure calculations with ease

- Relatively complex statistical measure
- spot unique disclosures
- without necessarily knowing Statistics & Coding



ESG narrative disclosures

Objectivity Analysis


- ESG disclosures - Narrative heavy
- Text analytics models are useful
 - Detect hints of greenwashing?

FORBES > MONEY

Canada Launches Greenwashing Investigation Into Lululemon

Jon McGowan Contributor @
I am an attorney who writes about ESG policy, laws, and regulations. [Follow](#)

May 13, 2024, 05:10pm EDT



NEW YORK, NY - AUGUST 26: The corporate logo for Lululemon hangs on a wall at their store in ...
[+] GETTY IMAGES

Following a complaint by environmental activist group Stand.earth, Canada has launched an investigation into deceptive marketing practices by lululemon. The application claims that lululemon has engaged in greenwashing by exaggerating climate action as part of its “Be Planet” marketing campaign. While the investigation has formally been opened by Canada’s Competition Bureau, no allegations have been made by the agency.

Source: <https://www.forbes.com/sites/jonmcgowan/2024/05/13/canada-launches-greenwashing-investigation-into-lululemon/?sh=7e6ab370196e>

Greenwashing in ESG disclosure

Indian ESG Disclosure Assurance Requirement

- ESG reporting has been mandatory for top 1000 listed companies from 2023 in XBRL
- Assurance requirements now being introduced



4.1.2. Rationale for proposal and approach

4.1.2.1. Assurance of critical KPIs will improve the credibility of ESG disclosures and reduce the risk of green-washing while at the same time limiting the cost of compliance which would otherwise have been incurred towards

Source – Balanced Framework for ESG reporting
https://www.sebi.gov.in/sebi_data/meetingfiles/apr-2023/1681703013916_1.pdf



Dashboard Indian ESG XBRL data:

Objectivity in ESG narratives

Analysis of Indian ESG XBRL data

Disclosure -“Approach To Adapt Or Mitigate Risk identified”



You

Count of Subjective /Objective entries



Data Analyst

The dataset contains:

- **712 Objective** entries
- **5,855 Subjective** entries

This indicates that a large portion of the entries are classified as Subjective, suggesting that many descriptions may lack specific, quantifiable information about risk mitigation strategies. If you have further directions or analyses you'd like to explore, feel free to let me know! [↗]

unique responses in the "InCaseOfRiskApproachToAdaptOrMitigate" column to understand the variability and depth of the data.

Analysis of 6500 disclosures text from 1000+ Indian ESG reports

Objectivity in ESG narratives

Examples from objective analysis

Objective
Subjective

Address and manage crises in
Continually invest in employee capability
both tangible and intangible
through mandatory training programs,
ways that we believe will
with a minimum of 40 hours of training
mitigate impacts effectively
per employee per year, to enhance
operational efficiency and safety

Specific Words in Disclosures

Examples from objective analysis

Data Analyst

To analyze the language for assertiveness versus vagueness, we'll look for certain linguistic characteristics. Assertive language tends to be direct, uses active verbs, and often includes specific, quantifiable details. In contrast, vague language may rely on generalities, passive constructions, and lack specifics.

Here's the plan for our analysis:

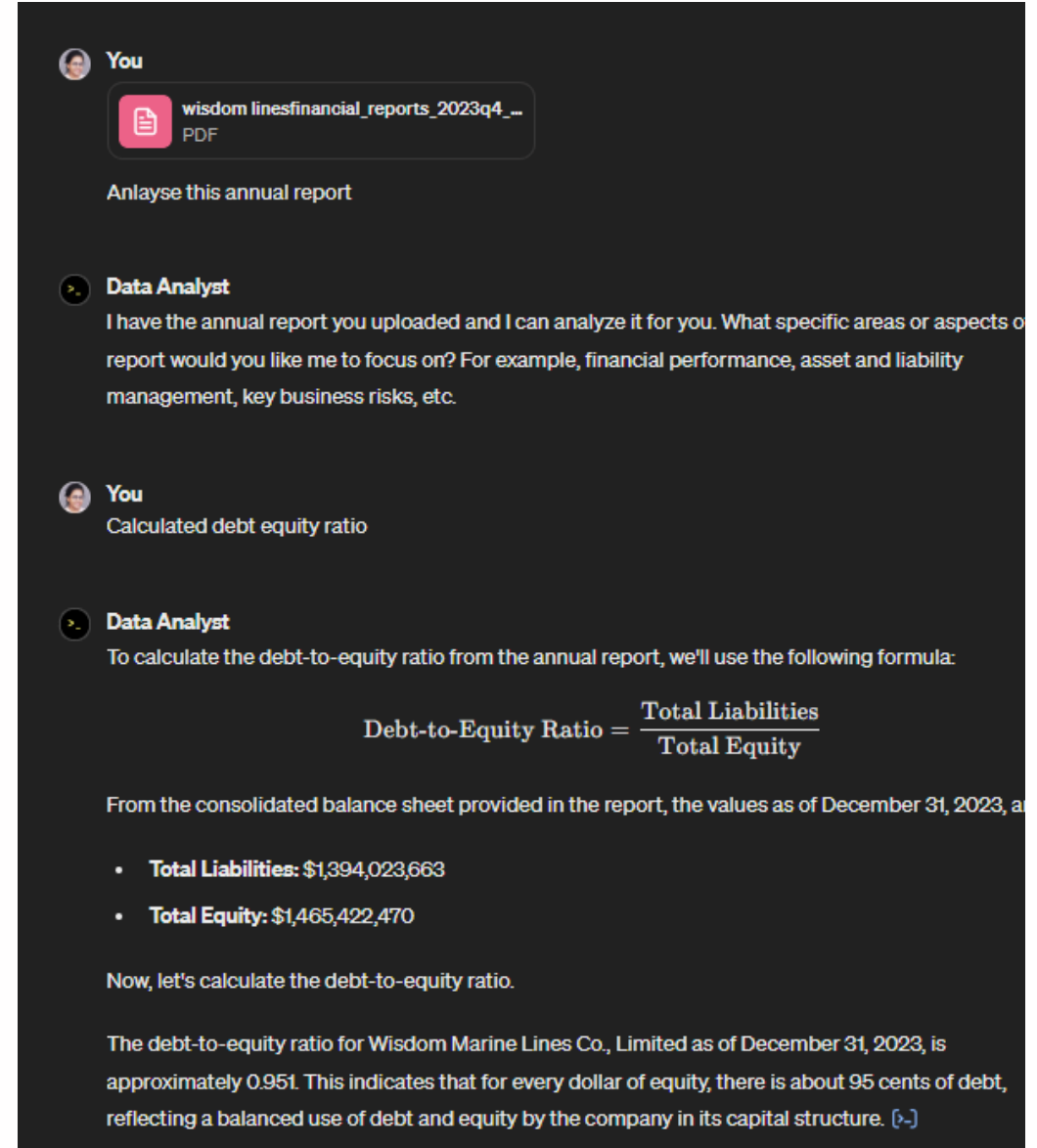
- 1. Identify Key Words:** Determine words or phrases that are typically assertive (e.g., "implement", "establish", "ensure") versus those that are vague (e.g., "aim to", "strive", "might").
- 2. Frequency Analysis:** Count how often assertive versus vague words appear in the responses.
- 3. Text Complexity:** Consider the complexity and clarity of the language used, which can also indicate assertiveness.

LLMs and unstructured data

Experiment with PDFs

Chat GPT understand PDFs annual report?

- It does;
- but ...



The screenshot shows a chat interface with a dark background. It features a user profile icon and the name 'You' next to a message where a PDF file named 'wisdom linesfinancial_reports_2023q4_...' is uploaded. The user asks the AI to analyze the report. The AI, identified as 'Data Analyst', responds by asking for specific areas of focus. The user then asks for the debt-to-equity ratio. The AI provides the formula for the ratio and lists the total liabilities and total equity values from the report.

You

wisdom linesfinancial_reports_2023q4_...
PDF

Analyse this annual report

Data Analyst

I have the annual report you uploaded and I can analyze it for you. What specific areas or aspects of report would you like me to focus on? For example, financial performance, asset and liability management, key business risks, etc.

You

Calculated debt equity ratio

Data Analyst

To calculate the debt-to-equity ratio from the annual report, we'll use the following formula:

$$\text{Debt-to-Equity Ratio} = \frac{\text{Total Liabilities}}{\text{Total Equity}}$$

From the consolidated balance sheet provided in the report, the values as of December 31, 2023, are:

- **Total Liabilities:** \$1,394,023,663
- **Total Equity:** \$1,465,422,470

Now, let's calculate the debt-to-equity ratio.

The debt-to-equity ratio for Wisdom Marine Lines Co., Limited as of December 31, 2023, is approximately 0.951. This indicates that for every dollar of equity, there is about 95 cents of debt, reflecting a balanced use of debt and equity by the company in its capital structure. [-]

LLMs and unstructured data

Experiment with PDFs

Where PDFs
extraction goes
wrong

Consolidated / Standalone accounts in different sections
Different terms do not always correspond to the same figures, and PDEs are not
parsed

Consolidated Statement of Changes in Equity
for the year

in € million

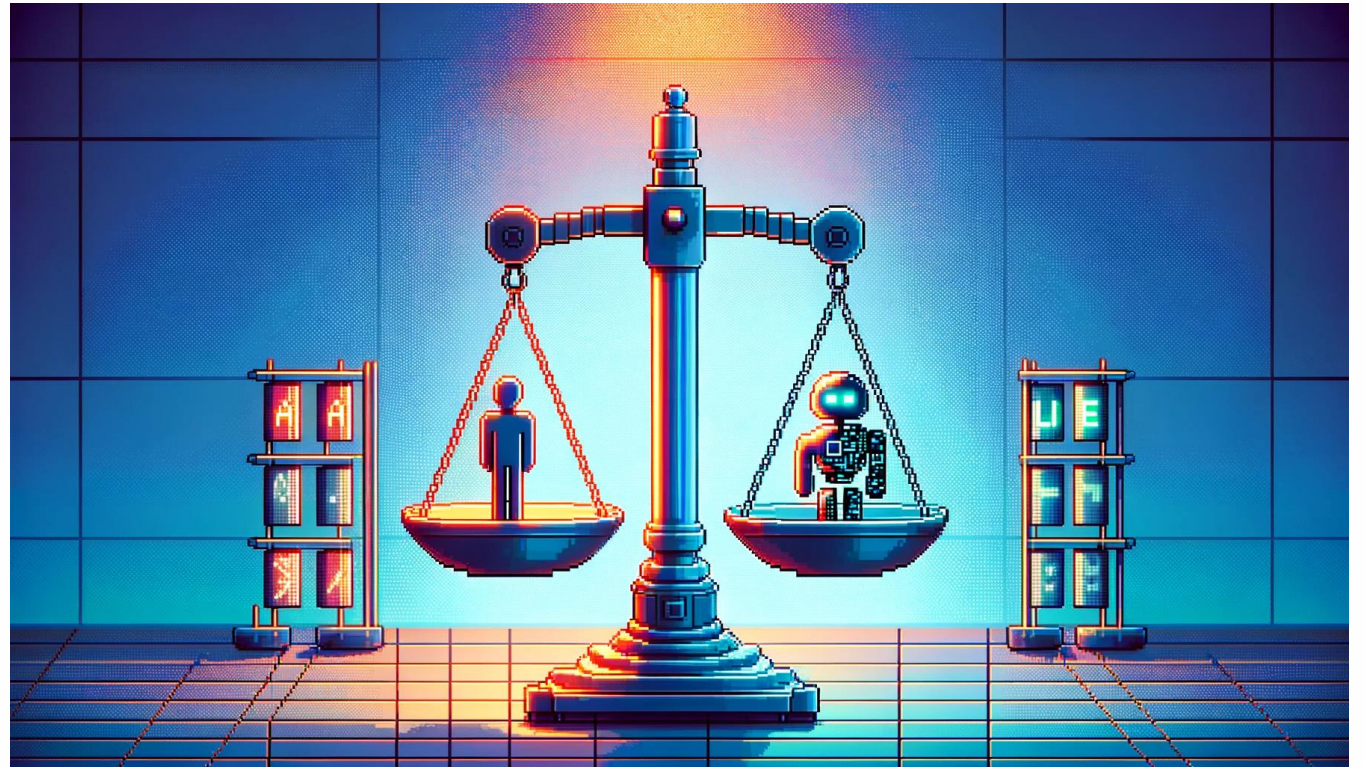
	Note	31.12.2023
ASSETS		
Non-current assets		
Goodwill	(17)	339.2
Other intangible assets	(18)	469.8
Property, plant and equipment	(19)	1,360.1
Investments in joint ventures and associates		6.2
Other non-current financial assets	(35)	43.4
Other non-current assets	(20)	36.7
Deferred tax assets	(14)	152.0
		2,407.4
Current assets		
Inventories	(21)	995.9
Trade and other current receivables	(22)	685.7
Income tax receivables	(14)	43.5
Other current financial assets	(35)	13.6
Cash and cash equivalents	(23)	703.5
		2,442.2
		4,849.6

- Share-based Payments:** A reduction of €5.4 million due to share transfer/vested LTIP.
- Other Adjustments:** Other net income/expense recognized directly in equity added €144.7 million to retained earnings.
- End of Year:** By December 31, 2023, retained earnings amounted to €604.9 million.

Do we still need XBRL?

A resounding yes!

- Digital Data is increasingly the primary source of data consumption
- The source data **MUST** be the responsibility of company management
- Cannot be left to different AIs to create their own versions of fundamental data, all with slightly different answers.



Conclusions

Explore LLMs for analysis

- **Enhancing Traditional Analysis:**
 - Leverage LLM in addition to conventional analysis methods
- **Beyond Predefined Metrics:**
 - Opportunities to explore data beyond the constraints of predefined dashboards
- **Natural Language Queries:**
 - Reduces the need for extensive statistical training
- **Structured Data Advantage:**
 - Vastly better LLM results with well-structured data



*Feel like experimenting?
Start with one xBRL-JSON report and ask questions.*

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Caveats

Constraints of the experiments

- Not Magic /Perfect
- Not an academic study
- Not an LLM expert
- Purely based on XBRL report and did not refer to the taxonomy
- Element names resembled the semantic meaning
- Disclosures in English language
- GPT-4 our version could not consume report with large text data

**too powerful
to ignore**

Questions?

revathy.ramanan@xbrl.org

How well does GPT-4 understands xBRL-JSON

You
Analyse the structure of the files

Data Analyst
The XBRL (eXtensible Business Reporting Language) JSON files you've provided from Nestlé for the fiscal years 2022 and 2023 have a structured format typical for financial reporting. Here's a breakdown of their main components and structure:

1. Document Information

- **Document Type:** Indicates the standard or schema the document adheres to, in this case, XBRL JSON.
- **Features:** Details any specific features used in the document such as canonical value representations.
- **Namespaces:** Defines the namespaces associated with various financial and business terminologies used in the document. For example, ``ifrs-full`` for IFRS standards, ``iso4217`` for currency codes, and ``nestlholdings`` for specific Nestlé namespaces.
- **Taxonomy:** Lists the taxonomies (or sets of definitions) that apply to the document, allowing it to be understood and validated against those definitions.

Recognises the structure

2. Facts

Each "fact" in the document represents a specific piece of financial data:

- **Value:** The actual data or measurement reported.
- **Dimensions:** The various attributes defining the fact, such as:
 - **Concept:** Identifies the specific accounting concept, e.g., ``ifrs-full:RevenueFromContractsWithCustomers``.
 - **Entity:** The identifier for the entity (company) to which the data applies.
 - **Period:** The time period that the data covers.
 - **Unit:** The unit of measurement, typically a currency code.

3. Contextual Information

Facts are not standalone; they are often accompanied by contextual dimensions that specify conditions or states relevant to understanding the fact, such as:

- **Language:** The language of the reported fact.
- **Decimals:** Indicates the scale of the value, i.e., how many decimal places to consider.
- **Segment:** Details about segments of the business if the data is segmented.

Understands the content of the report

Understands the meta data of facts

4. Metrics

Various financial metrics are reported, such as:

- Revenue
- Cost of Sales
- Operating Profit
- Net Income
- Assets and Liabilities
- Equity

These values are often reported in multiple periods, facilitating year-over-year comparisons.

Summary

The structure is primarily designed to ensure that data is reported in a standardized, machine-readable format, which makes it easier to automate processing and ensures consistency across different reports and entities. The key benefit of such a format is that it simplifies data aggregation, comparison, and analysis across different entities and time periods.

If you need more detailed analysis on specific financial metrics or comparisons between the years, please let me know!