

## Secondary Publication



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### Analyzing Narrative Disclosure Tone in German-Language Annual Reports : A Domain-Specific Wordlist Approach

Date of secondary publication: 23.04.2024

Version of Record (Published Version), Article

Persistent identifier: urn:nbn:de:bvb:473-irb-948585

#### Primary publication

Alexenko, Alina; Herberger, Tim A. (2023): „Analyzing Narrative Disclosure Tone in German-Language Annual Reports : A Domain-Specific Wordlist Approach“. In: Language, Individual & Society, Vol. 17, pp. 43-52, Burgas, Bulgaria: Science Events Ltd, <https://www.scientific-publications.net/en/article/1002551/>.

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## ANALYZING NARRATIVE DISCLOSURE TONE IN GERMAN-LANGUAGE ANNUAL REPORTS: A DOMAIN-SPECIFIC WORDLIST APPROACH

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### Abstract

*The aim of this paper is to investigate how narrative framing is utilized by HDAX companies when describing financial results. We analyzed the narratives in shareholder letters (Aktionärsbrief) and strategic reports (Lagebericht), which German companies employed to depict revenue and profit developments. In addition to focusing on negative or positive disclosure tone, as seen in previous research on English-language financial texts, we introduced an additional analysis category concerning communicated materiality, in line with the framing hypothesis of behavioral effects by users of financial reporting. Using the original texts of 89 annual reports in their native German language, we developed a domain-specific wordlists with three categories of words: (1) those used to address negative and positive developments, (2) those used to convey the manager's attitude towards reported information, and (3) those used for communicating materiality.*

**Keywords:** *annual report, framing, narrative disclosure tone, German language, domain-specific wordlist, biased tone, HDAX*

### 1. INTRODUCTION

The ‘typical’ annual report expands the financial figures from the financial statements with a variety of written and graphical information. The way this information is presented can influence the perception of the information, i.e. the framing effect (Taschner 2019). Subsequent research shows a certain degree of manipulative effect in the use of language and visual framing in annual reports (cf. Thomas 1997, Clatworthy & Jones 2003, Craig et al. 2004, Aerts 2005, Falschlunger et al. 2015). In addition to the potential unconscious behavioral effect, investors are also interested in the extent to which the narratives in the reports help predict future financial performance (Schleicher et al. 2007, Merkley 2014). The narrative tone (modality) of the statements plays therefore an essential role. The use of domain-specific (corpus-extracted) word lists (e.g. Henry 2008, Loughran & McDonald 2011) for automated analysis helps to understand the tone of financial information better than the use of general dictionaries (Bassyouny et al. 2022). This area of research requires additional data from outside the United States, particularly from Europe, which has a different regulatory environment than the United States and has recently undergone some regulatory changes (Bassyouny et al. 2022). Furthermore, compared to the English-speaking world, there are few studies on German-language reports (e.g., Bannier et al. 2019), even though German is an important business language, especially in the DACH countries. Therefore, the aim of this study is to analyze the annual reports of German companies listed in the HDAX index to determine which words are used to describe financial results. In this paper, we disclose for the first time the German word lists that have already been used in the empirical analysis of HDAX annual reports in Alexenko & Herberger (2023).

## 2. MATERIALS AND METHODS

### 2.1. Materials

The annual reports of the HDAX companies listed on the Frankfurt Stock Exchange from the year 2019 were used for the sample. If the fiscal year of a company does not correspond to the calendar year, the annual reports for the fiscal year 2018-2019 were used. The annual reports are analyzed in their original German language. The HDAX index contained 95 companies at the time of analysis. Some HDAX companies are not headquartered in Germany and publish their annual reports exclusively in English. These companies were excluded from the sample to ensure a homogeneous database. Subsequently, the annual reports of 89 HDAX companies were analyzed.

### 2.2. Methods

Our analysis focuses on the question of whether there are indications of narrative framing in the sense of the choice of words in the reporting of HDAX companies. The MAXQDA software was used for the analysis. In the first step the text fragments related to revenue and profits or losses (incl. earnings before interest and taxes, EBIT, earnings before interest, taxes, depreciation and amortization, EBITDA) were manually selected and deductively coded.

Table 1 contains examples of narrative framing in HDAX annual reports:

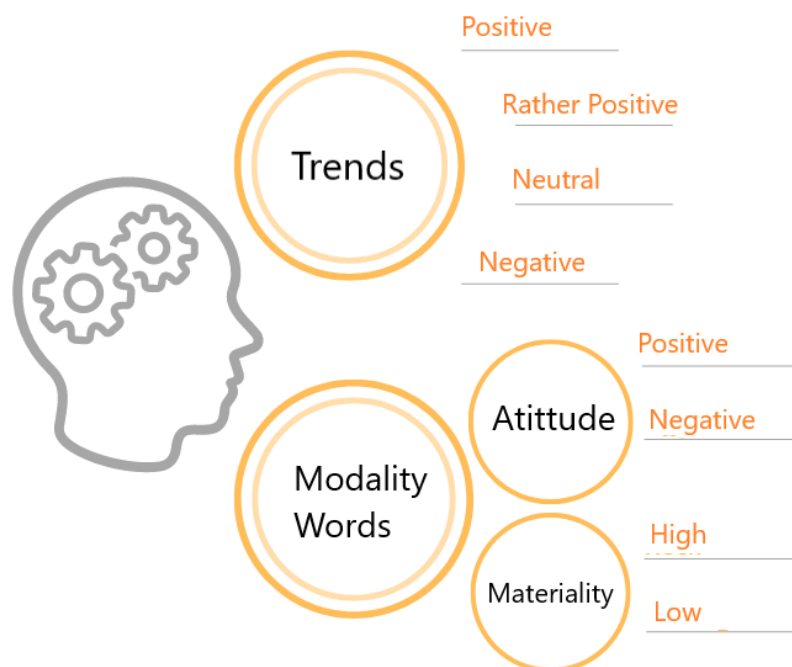
Examples of narrative framing in HDAX annual reports		
Company	German Version of the Report	English Version of the Report
SAP SE (Annual Report 2019, p.8)	„Dieses <b>anhaltende</b> Wachstum macht uns <b>sehr stolz</b> “	„And we take <b>great pride</b> in this <b>continued</b> growth story”
S&T AG (Annual report 2019, p.5)	„Unsere Auftragslage ist <b>weiterhin exzellent</b> “	„Our order situation <b>remains excellent</b> ”
Deutsche Bank AG (Annual Report 2019, p. III)	„Es zahlt sich nun aus, dass wir <b>schnell und konsequent</b> in unsere Transformation gestartet sind. Zunächst geht so ein <b>grundsätzlicher</b> Umbau mit <b>erheblichen</b> Belastungen einher. Das ist sehr <b>bedauerlich</b> . Doch unser Jahresverlust von 5,3 Milliarden Euro nach Steuern zeigt letztlich vor allem, wie <b>rasch</b> wir vorangekommen sind. Von den umbaubedingten Belastungen, die wir für die Zeit bis 2022 erwarten, sind 70 Prozent bereits in den Ergebnissen verbucht. Wir haben jedes unserer Finanzziele für das vergangene Jahr <b>erreicht oder sogar leicht übertroffen</b> :“	„We are currently <b>benefiting</b> from the fact that we got off to a good and disciplined start with our transformation. The upfront costs of such a <b>profound</b> reorganisation are <b>significant</b> which is <b>painful</b> for all of us. However, having said that, our full-year net loss of 5.3 billion euros shows how quickly we have made <b>progress</b> : we have already absorbed 70 percent of the total expected transformation effects for the period through 2022. We are executing <b>in line</b> with or <b>slightly ahead</b> of our targets:”

**Table 1.** Examples of narrative framing in HDAX annual reports

Source: Annual Reports of SAP SE, S&T AG, Deutsche Bank AG, Emphasis (bold) added by authors

In the second step, the previously coded segments were read analyzing which modality words were used to describe business developments and the company's position on these developments or their materiality (significance). Modality is understood as the expression of an attitude on the part of the person making the statement, or their subjectivity and emotion in relation to the information communicated (Kiefer, 1987). Inductively found modality words were coded using an automated search option of the MAXQDA-Software in all annual reports. For the purpose of further analysis of code overlaps (co-occurring), an entire sentence was coded for each word. The first coding attempt showed that there was a discrepancy in the automatic coding. The question was how MAXQDA should search for the selected word: as a 'whole' word (with the option to search for the all lemmata forms of a word) or as just a combination of letters. Since compound words are typical for the German language, a search for whole words and their lemmata forms would sometimes produce useless results since the compound words would be ignored by the software. Therefore, it is decided individually in each case how to organize the search: by whole words or as a combination of letters.

After this step of inductive coding, the identified and coded words are classified to the developed code categories. The following figure 1 illustrates the developed coding system:



**Fig. 1.** Coding System

Source: Alexenko & Herberger, 2023; translated from German by authors

(1) Words for describing business developments (mostly verbs):

- Positive business development: Semantically unambiguous, with positive connotations (e.g. 'grow', 'climb').
- Rather positive business development: Semantically open, positive connotation (e.g. 'develop', 'achieve')
- Neutral business development: Semantically open, with neutral connotations (e.g. 'lie' (German: 'liegen'), 'amount to').
- Negative business development: Semantically unambiguous, negative connotations (e.g. 'diminish', 'slow down').

When classifying the words describing business trends, it was found that it is not always possible to assign them to the three previously considered categories (positive, negative, neutral), as there are words that have a positive connotation but do not mention the actual business trend and thus obscure it. For such words, an additional category ‘rather positive: semantically open, but positively connoted’ business developments was created.

(2) Modality words for communicating the attitude of the managers:

- Positive connotation (e.g. ‘pleasant’, ‘stable’)
- Negative connotation (e.g. ‘weak’, ‘regrettable’)

(3) Modality words for the importance of the information for the company (materiality, significance):

- High: focuses the reader's attention (e.g. ‘rapid’, ‘clear’, ‘essential’)
- Low: distracts the reader's attention (e.g. ‘slight’, ‘minor’)

The communication of the attitude and materiality was linked to the Framing-Hypothesis (Taschner 2019), that choice of the words by managers can cause the behavioral effects by the readers (users) of information, so the words communicating high materiality may focus the readers' attention, while the words, communication lower importance distract the reader's attention from the reported information.

### 3. RESULTS

In the first step of coding 664 text fragments to revenue and turnover and 689 fragments to the profit, loss, EBIT(DA) were coded. In the second step in the previously coded fragments the modality words according to the in the section 2 described coding system were found and coded. The following table shows the Frequency of occurrence of the coded words by categories.

Number of occurrences	All	Shareholder Letter	Strategic Report
<b>Category</b>	<b>(1) Trends</b>		
Positive	2,335	229	2,106
Rather Positive	974	131	843
Neutral	1,697	87	1,610
Negative	927	43	884
<b>Category</b>	<b>(2) Attitude</b>		
Positive	773	136	637
Negative	366	32	334
<b>Category</b>	<b>(3) Materiality</b>		
High	1,631	159	1,472
Low	371	31	340

**Table 2.** Frequency of occurrence of the coded words by categories

Source: own

Figure 2 below shows the breakdown of categories in the shareholder letter (voluntary part of the report) and the strategic report (mandatory part of the report). For better comparability, only the reported Group results (for a company as a whole) are compared; business segment results (e.g. by region, division or product) are not included, as they are only discussed in detail in the Strategic Report and rarely in the Letter to Shareholders.

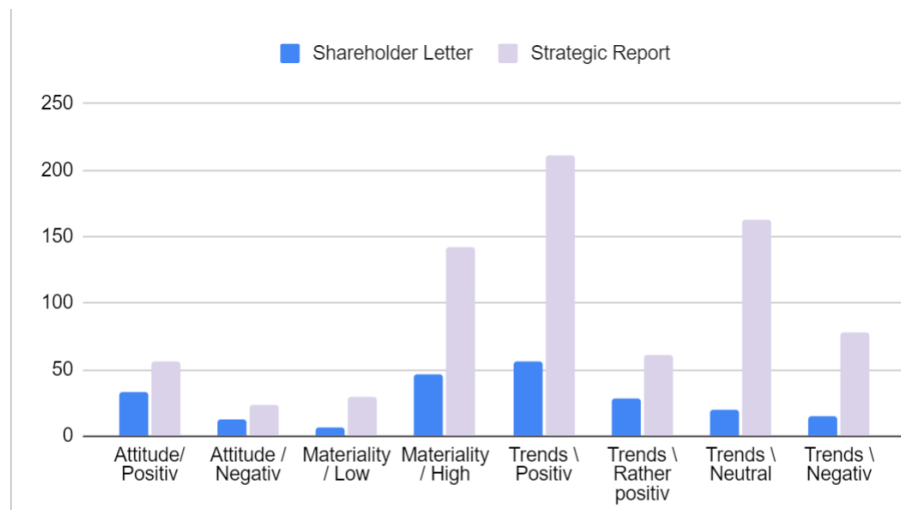


Fig. 2. Coding Results

Source: Alexenko & Herberger, 2023

The following Table shows the developed word lists. The brackets indicate the frequency of occurrence:

Category (1) Trends	
<b>Positive</b>	Steigen / Anstieg (732), wachsen / Zuwachs /Wachstum /weiterwachsen (400), höher (315), erhöhen (264), verbessern (142), liegen + über (123), steigern (102), nehmen / zunehmen / Zunahme (79), übertreffen (64), Plus (41), zulegen (26), heben /erheben (16), ausweiten (11), überschreiten (8), verdoppeln (6), klettern (4), vergrößern (2)
<b>Rather Positive</b>	Entwickeln / Entwicklung (336), erzielen (278), erreichen (155), kompensieren (58), erwirtschaften (49), realisieren (21), ausgleichen (18), erfüllen (15), leisten (12), generieren (12), ausbauen (9), annähernd (5), oberhalb (6)
<b>Neutral</b>	Liegen (553), betragen (258), verzeichnen (168), belaufen (163), entsprechen (160), bleiben (86), entfallen (83), ergeben (92), fallen (44), unverändert (35), ausweisen / wies aus (19), verbuchen (10), verändern (10), summieren / summieren auf (8), buchen / zu Buche schlagen (6), herrühren (2)
<b>Negative</b>	Rückgang (194), liegen + unter (112), senken (110), rücklaufen / rückläufig /Rücklauf (87), geringere (75), niedrig / niedriger (75), verringern (69), reduzieren / Reduktion (66), gehen + zurück (45), angepasst (30), hinter (18), schwächen (14), verschlechtern (12), mindern / Minderung (9), abnehmen (6), stagnieren (3), bremsen (2), halbieren (2), verfehlen (2), nachgeben (1), unterschreiten (1)
Category (2) Attitude	
<b>Positive</b>	Stark (176), gut / besser (140), erfolgreich /Erfolg (71), profitieren /profitabel (46), Rekord / Rekordwert (40), stabil (36), erfreulich (44), anhaltend (31), konstant (27), solide (22), günstig (15), dynamisch (14), nachhaltig (11), kontinuierlich (8), innerhalb (10), kräftig

	(8), robust (8), zufrieden / zufriedenstellend (9), zuversichtlich (7), hervorragend (6), attraktiv (4), stetig / stets (5), konsequent (5), Höchststand (4), angestrebt (3), herausragend (3), beeindruckend (2), exzellent (2), großartig (1), optimistisch / Optimismus (1), überraschend (2), zuverlässig (2), sehenswert (1), vollumfänglich (1), eindrucksvoll (1), sagenhaft (1), einzigartig (1), blitzsauber (1), Hoffnung / hoffen (1), fortlaufend (1), stolz (1), Glück / glücklich (1), überzeugt (1), gut aufgestellt (1), Bestwert (1)
<b>Negative</b>	Negativ (115), Belastungen / belastet (102), schwach / abgeschwächt (47), geprägt (34), schwierig (26), herausfordernde (10), verhaltener (9), Unsicherheit (8), Krise (6), schlecht (2), nicht ganz (2), zurückhalten (2), nicht zufrieden (1), bitter (1), enttäuschend (1), bedauerlich (1), sorgenvoll (1)
<b>Category (3) Materiality</b>	
<b>High</b>	Deutlich (256), insbesondere (249), wesentlich (205), vor allem (122), sehr (95), trotz (59), größte (60), erneut (42), wichtig (43), mehr als (36), hauptsächlich (35), dagegen (30), jedoch (27), besonders (27), signifikant (24), überproportional (23), maßgeblich (27), allerdings (18), erheblich (16), überwiegend (15), ausschlaggebend (15), sogar (13), spürbar (12), vorwiegend (10), absolut (8), überdurchschnittlich (6), weit / weitgehend (7), außerordentlich (6), bemerkbar (5), ausschließlich (5), äußerst (3), ordentlich (3), bemerkenswert (3), bedeutend (2), konkret (2), exakt (2), meist (1), nämlich (2), nennenswert (2), entscheidend (2), merklich (1), dramatisch (1), entscheidend (1)
<b>Low</b>	Leicht (186), gering / geringfügig (94), moderate (22), knapp (21), allerdings (18), etwas (18), erwartungsgemäß (8), keine / nicht nennenswerte (1), üblicherweise (2), saisongemäß (1)

**Table 3.** Wordlists for (1) Trends, (2) Attitude and (3) Materiality

Source: own

It is striking how often the word ‘record’ is used: In 63 of the 89 HDAX annual reports analyzed, the word was mentioned at least once. Daimler AG even used it 15 times. It can also be observed that the mention of ‘record’ attempts to give a positive connotation to possible declines. For example:

*“After the record value of €6.98 in the previous year, a total of €4.90 was achieved in 2019.” / „Nach dem Rekordwert von 6,98 € im Vorjahr wurden im Jahr 2019 insgesamt 4,90 € erzielt“ (Pfeiffer Vacuum Technology AG, Annual Report 2019, p. 45.)*

#### 4. DISCUSSION

Without a benchmark, financial ratios are often not meaningful enough. With the help of their choice of words, managers make a classification that, on the one hand, makes an assessment and, on the other hand, is intended to draw the reader's attention to certain figures (e.g. with the help of words such as ‘significant’) or to distract from certain figures (‘slightly’). Top management's perspective on the reported information is often expressed by words such as ‘pleased’, ‘unfortunately’, etc. These evaluations lead the addressee to interpret the information more in the sense of the top management, to the extent that the reader also trusts the top management and sees them as experts, since they (supposedly) have an information and competence advantage or are attributed to them by the addressees. In principle, top management thus has the opportunity to exploit the trust placed in it by the addressees (Alexenko & Herberger 2023).

When it comes to framing, Taschner (2019) emphasizes that the design elements such as wording and linguistic explanations, redundancy, colors, and layout are probably done without manipulative intent in most cases. Nevertheless, some researchers note that there is a tendency that could indicate



manipulation through framing. For example, Thomas (1997) uses the example of an American company to show that when profits are falling, more passive constructions and more gerunds are used. In the case of negative news, more reference is made to a factual, objectified situation caused by external circumstances and not attributable to acting persons in the company's management, who might otherwise be held legally responsible (Thomas, 1997). According to Tauringana and Chong (2004), voluntary disclosures in annual reports contained a significantly higher proportion of positive corporate news than the legally required sections in annual reports. Therefore, it is reasonable to assume that top management is more likely to emphasize positive news in the voluntary sections. Clatworthy and Jones (2006) also show that unprofitable companies focus more on communicating possible future developments than on past performance. According to the Association of Chartered Certified Accountants [ACCA] (2016), managers would refer more to known facts ('investors know well', 'it is known', etc.) and tend to use superlatives and very positive words ('great', 'definitely', etc.) on the one hand and less scary words ('worried', 'nervous', etc.) on the other. Research on corporate communication has highlighted the essential role of expressing emotions on the part of management. On the one hand, this helps to boost employee morale and trust ('creating a sense of 'we''), but on the other hand, the links between emotions and business outcomes suggest their predictive power (Pengnate et al., 2020). This means that the analysis of emotions in the texts of shareholder letters and annual reports can help investors to better assess future developments. Therefore, the analysis of the tone (or modality) of disclosed information is of great interest to researchers.

Before Loughran-McDonald (2011) introduced their domain-specific dictionary for analyzing the narrative tone of financial disclosures in English-language, a commonly used platform for assessing the tone of English-language business documents was software DICTION, which used the general English dictionary (today, this software also provides an option to create a customized dictionary). Loughran-McDonald (2011) following Henry (2008) showed that DICTION was inappropriate for assessing the tone of financial disclosures, leading to misclassification, and have created the alternative dictionary by extracting vocabulary from financial texts. Bannier et al. (2019) created the Bannier, Pauls, and Walter (BPW) dictionary for the German language based on Loughran and McDonald's (2011) English dictionary by translating and adjusting the positivity, negativity, and uncertainty word lists. Bannier et al. (2019) also tested the equivalence of their dictionary to the original English version using a sample of 1,402 quarterly and annual reports of German DAX and MDAX companies, available in German and English, estimating simple pairwise correlations, Spearman rank correlations, and intra-class correlations of the sentiment measures calculated once with the English dictionary and once with the German dictionary. One of the problems they tried to solve was the difficulty of automated analysis of German compound words. To solve this problem, the authors explicitly searched for German compound words in the German version of their text corpora and added them to their dictionary. Following the Loughran-McDonald (2011) dictionary, Bannier et al. (2019) created word lists for the 3 categories: negative, positive, and uncertain. In our research presented in this paper, we arrived at the more detailed classification.

First, it was found that it is not always possible to assign them to the three previously considered categories (positive, negative, neutral), as there are words that have a positive connotation but do not mention the actual business trend and thus obscure it. For such words, an additional category 'rather positive: semantically open, but positively connoted' business developments was created.

Secondly, in compliance with the Bannier, Pauls, and Walter (BPW) dictionary, which contains 10,146 negative and only 2,222 positive words, we have seen another proportion in the real speech of German companies when describing the specifically financial results such as revenue or profit (loss). We found that less negative words were used, therefore our list contains much more of positive words than of negative ones.

Third, based on the framing hypothesis of Taschner (2019), we have developed an additional important category: materiality, assuming that the choice of words by managers can cause the behavioral effects by the readers (users) of information, so the words communicating high materiality can focus (grab) the readers' attention, all the words, communication of lower importance distract the reader's attention from the reported information. This additional category allows to have a more precise look at the framing in



the use of language. Thus, in our previously published work (Alexenko & Herberger 2023) we tested our classification, which allowed us to come to the following results when comparing the co-occurrence of the categories. The results of the analysis of 89 annual reports in the original language (German) using the word lists discussed in section 3 show that companies try to emphasize desirable developments, especially in the voluntary part of reporting – the shareholder letter. Modality words that communicate lower materiality were used more often to describe undesirable business developments than neutral and positive business developments. In addition, positive business developments were heavily emphasized with positive and attention-grabbing (communicating higher materiality) modality words (Alexenko & Herberger 2023). In particular, Alexenko & Herberger (2023) have shown that more distracting ('low materiality') modality words were used to describe negative business developments (37.57%) than neutral (17.89%), rather positive (11.81%), and positive (32.74%) business developments (example: "EBIT *decreased slightly*"). This at least suggests a strategy of linguistic obfuscation. The positive developments were strongly emphasized with positive attitude words (39.21% of all attitude words occurrences) and attention-focusing materiality words (41.51% of all materiality words occurrences, example: "EBIT *fortunately* increased *substantially*"). From this observation, it is reasonable to assume that the hypothesis of a manipulative type of narrative framing (biased tone) can be confirmed.

## 5. CONCLUSIONS

For the digitization of textual analysis, word lists are necessary, which can be generated in the process of inductive coding of actual texts. In this context, our work provides an important input, as actual word lists on the financial results of German companies have been compiled in German for the specific analysis goal of assessing the narrative framing of information on revenue, profit or loss. Given the importance of the German language in financial reporting and the importance of the German economy, our analysis provides important insights for domestic and international investors.

A study using a proposed word list and classification shows that in the reporting of companies from the HDAX index for the 2019 financial year, the intensity of framing varies depending on the location within the report, with more intense framing in the shareholder letter compared to the management report. The study also found that companies tend to use attention-diverting words for negative business developments and attention-focusing words for positive developments. However, the study suggests that this narrative framing is not necessarily manipulative, but rather the result of carelessness on the part of report authors. The research also highlights a lack of literature on non-American companies, which may be due to the highly standardized nature of annual reports in the US, making them more amenable to analysis.

However, our research is limited by the fact that the corpus of 89 annual reports is quite small. Nevertheless, the application of the Masheen learning approach (e.g. supervised Masheen learning) using the logic of our coding structure can help to develop an extended vocabulary from the larger set of documents. Moreover, our extracted vocabulary covers only one (perhaps the most interesting for investors) aspect of the reporting: the explanations of the revenue and profit development in the reported year. For the many other relevant reporting topics (e.g., forecast, costs, research and development, human resources, risk management, sustainability, etc.), the other words are likely to be used by companies that may require a specific vocabulary (word lists) for automated analysis.

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