

Department of Business and Management

Master degree in Corporate Finance

Chair of Financial Statement Analysis

**Is ChatGPT capable of analysing and forecasting future business plans based on the letters to shareholders? An empirical analysis on EuroNext Milan listed companies.**

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**TABLE OF CONTENTS**

**Abstract**.....2

**Chapter 1: Literature Review**

    1.1 AI and its new cutting-edge application ChatGPT.....3

    1.2 ChatGPT’s support in financial research and disclosure.....6

    1.3 Future business plans disclosure in shareholder letters.....9

**Chapter 2: Methodology**

    2.1 Data collection and analysis structure.....13

**Chapter 3: Empirical analysis**

    3.1 Strengths and weaknesses of future business plans through the lenses of ChatGPT 4.0.....18

        3.1.1 Quantitative analysis.....18

        3.1.2 Qualitative analysis.....23

    3.2 Aspects ChatGPT 4.0 suggests detailing further.....28

        3.2.1 Quantitative analysis.....28

        3.2.2 Qualitative analysis.....32

    3.3 Testing ChatGPT’s ability to comment on risk management.....36

        3.3.1 Quantitative analysis.....36

        3.3.2 Qualitative analysis.....40

**Conclusion**.....44

**Bibliography**.....47

**Sitography**.....49

## **ABSTRACT**

Technology is rapidly evolving and keeping up the pace with the latest digital advancements can almost be considered a tiring task. Given the scarcity of literature in this domain, this research paper seeks to put to test and provide additional empirical evidence of ChatGPT's capabilities. It is essential to know how to effectively exploit such a powerful tool and how to judiciously combine human intellect with the possibilities offered by artificial intelligence. This investigation probes the extent to which ChatGPT is capable of analysing and evaluating future business plans delineated in letters to shareholders from a selected sample of 30 companies listed on the EuroNext Milan market. The methodology framework of this study encompasses a combination of a quantitative keywords and statistical parameters analysis and a qualitative review to assess the effectiveness of ChatGPT's responses. The focal business themes under examination are: risk management, financial implications, stakeholders' engagement, digitalization and technology, and sustainability. The ultimate goal of this research is to understand how comprehensively ChatGPT interprets and discusses all the most frequent topics associated with future business plans, with an aim to identify whether there are specific topics that ChatGPT systematically addresses with more emphasis than others when being provided with the texts of letters to shareholders.

## CHAPTER 1

### LITERATURE REVIEW

#### 1.1 AI AND ITS NEW CUTTING-EDGE APPLICATION CHATGPT

The last few decades have been characterised by revolutionary digital and technological advancements. The way human beings carry out many jobs and ordinary activities has significantly changed. In fact, nowadays many processes are automated and more efficient compared to the past, many job positions have been replaced by computers, machines and systems based on artificial intelligence that take less time to perform different tasks and require a minor effort.

In particular, **artificial intelligence** is such a powerful tool because it uses machines and computers to mimic problem-solving and decision-making capabilities of the human mind. Generally, systems exploiting artificial intelligence rely on **machine learning** (Janiesch et al., 2021; Jiang et al., 2022).

*Machine learning* is the groundbreaking technique that allows systems to learn from experience thanks to learning algorithms capable of building models from vary datasets. This “*learning by doing*” process is the base to develop any model capable of making predictions on different observations. Through the utilization of a “*training set*” of data fed to the learning algorithms, the system is trained to work properly on any new sample. To get a brief insight on how machine learning works, it has to be noted that there exist two main types of machine learning: *supervised learning* and *unsupervised learning*. More precisely, supervised learning is an AI model that learns by being given the mappings between input and outputs, hence the training data is labelled with the corresponding right output. Many applications of supervised learning include regression models, in which the AI model predicts numbers out of infinite many possible ones, and classification, a type of supervised learning that predicts categories out of a finite and small number of possible outcomes. On the contrary, unsupervised learning works on unstructured data, which means that data only comes with the input, there is no mapping with output labels. Unsupervised learning is mainly used for clustering (grouping similar datapoints together), dimensionality reduction (compressing data) and anomaly detection (identification of unusual datapoints) (Zhou, 2021; Jebara, 2012).

In the last few years, data science and machine learning have undergone several remarkable evolution processes which led to the generation of even more sophisticated learning algorithms and intelligent systems. Specifically, the rise and evolution of **deep learning** marks a milestone in digital and technological advancement (Goodfellow et al., 2016). Deep learning is another type of machine learning based on artificial neural

networks with learning capabilities that excel those of human beings (Madani et al., 2018). Deep learning, as well, can be classified into **discriminative** or **generative learning**. On one hand, the discriminative deep learning model is trained on labelled data and works by studying the relationship between the features of the datapoints and the corresponding output labels. On the other hand, generative learning is an AI model that is capable of generating new data similar, but not identical, to the set it was trained on, in fact, it basically crates new content from learning the distribution of unstructured data (Jebara, 2001).

Among the different **generative AI** applications, an interesting one to mention refers to **NLP** (*Natural Language Processing*) technologies. **Natural Language Processing** is used to analyse and emulate human language in an automated way. NLP's required capabilities range from the acquisition of lexical and semantic characteristics of a text, to the manipulation and generation of content, concepts and logical structures (Chowdhary, K. & Chowdhary K. R., 2020).

The analysis of the most important types of AI and machine learning models serve the scope of introducing properly **ChatGPT**. ChatGPT or "*Chat Generative Pre-trained Transformer*" is a generative AI application released to the public domain by OpenAI on November 2022 (Fui-Hoon Nah et al., 2023; Baidoo-Anu & Ansah, 2023). This online service has become extremely successful and worldwide known in a very short time. The users have understood its incredible potential and appreciated its ability to generate tailored and detailed responses rapidly (Hua et al., 2024; Beckmann et al., 2024). It is possible to briefly introduce ChatGPT as an application powered by a generative AI technology capable of producing human-like responses, surprisingly creative contents and extrapolating and computing data from different sources (Fui-Hoon Nah et al., 2023).

Knowing how to exploit such a powerful problem-solving AI assistant to deal with various tasks can save an incredible amount of time and improve productivity. Moreover, it does not surprise that ChatGPT is the fastest growing NLP generative AI practice since it is easy to use, it presents augmented abilities in understanding the context of a prompt or document, it takes less time in the generation of tailored answers compared to previous chatbots and similar AI services and it answers using a human-like language. In fact, the majority of preceding natural language models were based on supervised learning, thus these models worked by being provided with the "right answers" (mappings between inputs and output labels). Therefore, to overcome the limitations of this approach and ensure enhanced generalization capabilities, OpenAI has made ChatGPT rely on broader training sets in order to allow the AI application to develop enhanced comprehensive understanding capabilities, improve its efficiency and its ability to deal effectively with basically every different topic and task (Hua et al., 2024).

Moreover, another strength of ChatGPT is its ability to deal with multiple conversations simultaneously, reducing human intervention in numerous fields and increasing efficiency by providing faster generated responses. Another valuable characteristic of ChatGPT is its capacity to fine-tuning to adapt the responses to the different queries and specific levels of performance. On the basis of the prompts, ChatGPT adjusts the focus to meet the specific requests of the users (Kalla et al., 2023).

Hence, this amazing feedback and support provider requires specific and detailed prompts to address different tasks properly. The way questions and inputs are submitted to ChatGPT significantly influences the outcome generated. Prompts can be short paragraphs, brief instructions or detailed and complex texts and documents, on the basis of the typology of the task. Obviously, the more specific, tailored and informational the way a request is structured, the higher the quality of the response is likely to be (Cao & Zhai, 2023; Fuchs, 2023). As a consequence, if the prompt is imprecise or the model is not fed with sufficient data and trained properly to guide it to the desired result, the response is likely to be inadequate to the task, incomplete or present biases, also increasing the risk of divulging misinformation (Hua et al., 2024; Iskender, 2023).

Therefore, despite all the advantages of this incredible generative AI application as far as content generation and text comprehension and processing are concerned, it is still not perfect and presents limitations. For instance, another problem is linked to the question about the originality of the contents generated. Despite the outstanding capabilities of ChatGPT, it generates texts and analysis by combining the training data, as a result, it is possible to conclude that ChatGPT does not have a creative intelligence that is capable of generating content from scratch, but its answers rely on data extrapolated and processed from existing works (Hua et al., 2024; Thorp, 2023).

As a consequence, ChatGPT is a truly powerful tool, but an excessive reliance on it can be detrimental. Not only because the generated answers are not 100% accurate and reliable and require information verification, but also because in the long run it mines the development of critical thinking and problem-solving skills (Hua et al., 2024; Iskender, 2023).

To sum up, ChatGPT is an outstanding assistant capable of extraordinary problem-solving abilities for an AI and output generation, but at the same time people can be reassured because even the most spectacular innovation such as ChatGPT cannot substitute completely the cognitive and creative characteristics of the human mind. The best possible solution to effectively handle the potentials of this technology is to combine human efforts and AI faster and convenient research and generation capabilities (Fui-Hoon Nah, 2023).

## 1.2 CHATGPT'S SUPPORT IN FINANCIAL RESEARCH AND DISCLOSURE

ChatGPT has proved more than once to be one of the greatest generative artificial intelligence applications of all times. This justifies its worldwide usage in multiple areas to accomplish different tasks. Not only students and normal people benefit from the advantages and outstanding capabilities of ChatGPT, but many industries and academies exploit it to boost their productivity and fasten processes as a result of its ability to perform ordinary office work in place of humans such as automatic email responses, presentation slides and projects proposal drafting (Cao & Zhai, 2023).

Due to its rapid growth and worldwide diffusion, it is normal to question the extent to which it is possible to exploit this cutting-edge artificial intelligence technology. Focusing on the fields of finance and accounting, several studies have been published and many empirical experiments have been carried out to illustrate how to take advantage of ChatGPT in financial research, financial disclosure and related matters. However, the literature that attests properly all the opportunities that derive from such a powerful AI assistant is still very limited and the questions around the topic are increasing.

To give an example, some researchers have conducted investigations to determine the extent to which ChatGPT proves to be able to write the notes to financial statements in public companies' annual reports. The research paper *«Don't Worry Accountants, ChatGPT Won't Be Taking Your Job...Yet»* by Taylor S. and Keselj V. published in 2023 probes the topic in order to evaluate ChatGPT's utility in understanding and analysing financial data and its reliability as far as correct and transparent disclosure of financial information is concerned. The paper demonstrates that by comparing ChatGPT's generated texts and the notes written by the original human authors, the resemblance is still very low. However, at the same time they tested the readability of the two different texts, and it emerged that the results obtained by ChatGPT show a substantial increase in readability compared to the official notes disclosed. This is an incredible result which shows the ability of ChatGPT to turn complex financial documents into more accessible ones, improving the ease with which people from diverse academical backgrounds can read and understand the content of the notes. Moreover, another significant result is achieved by the finding that a good number of the texts generated by the AI are not easily categorizable as the product of a machine or the human intellect (Taylor & Keselj, 2023).

Some research papers delve into the issue of understanding ChatGPT contribution in financial academic research. An example is provided by the article *«Bridging the gap – the impact of ChatGPT on financial research»* (Cao & Zhai, 2023). In the mentioned research paper, it is highlighted how ChatGPT 4.0 is capable of analysing the sentiment of

a piece of text referring to articles published by important business and economic newspapers such as the *Financial Times*. According to the specific prompt, ChatGPT actually assigned values to grade the sentiment of the news. Then, the authors of the research paper decided to get even more specific with their requests, analysing the articles' ESG and corporate culture sentiment. To accomplish this result, it was necessary to count the main keywords related to the specific topics under examination and on the basis of this frequency, ask ChatGPT to assign a value on a range from -1 to 1 to the ESG and corporate culture sentiment. The research paper published by the authors Zhai J. and Cao Y. in 2023 supports, with the evidence provided, the idea that ChatGPT has the potential to efficiently assist researchers by generating accurate logical analyses of accounting and financial textual contents (Cao & Zhai, 2023).

Another interesting study has been conducted with respect to the identification of unusual communication in earnings calls. The research has been conducted by Beckmann et al. and the results were published in the research paper «*Unusual Financial Communication-Evidence from ChatGPT, Earnings Calls, and the Stock Market*» in 2024. As earnings calls can generally be divided into two main sections, namely the management's overview of the company's operations and the Q&A sessions, the study purposely focuses on the Q&A sessions part. First of all, ChatGPT was provided with a large sample of Q&A sessions and asked to evaluate whether the communication can be defined as usual or unusual. After that, ChatGPT was asked to provide an explanation of the criteria used to identify certain Q&A sessions as "unusual communication". Finally, the last prompt to ChatGPT was to reanalyse the sessions classified as "unusual" and provide a justification for this categorization using the criteria emerged as a result of the second prompt. To conclude, the goal of this paper was not to test ChatGPT's capabilities, but the researchers consciously exploited ChatGPT as a tool to understand the frequency with which communication is unusual and the extent to which it is possible to assert that it can be classified this way (Beckmann et al., 2024).

Finally, another similar work that is worth mentioning is «*Bloated Disclosures: Can ChatGPT Help Investors Process Information?* » by Kim et al., 2023. The paper investigates, as well, the benefits of exploiting ChatGPT to process and extract pieces of information from a consistent volume of complex corporate disclosure files. In detail, ChatGPT is used to make summaries of the Management Discussion and Analysis sections (MD&A) in annual reports. The scope is to explore the limits and strengths of ChatGPT when requested to extrapolate the most relevant information content in a text. In conclusion, the research demonstrates that ChatGPT was capable of reducing each text by approximately 80% of its length, moreover, the generative AI system was capable of



emphasizing even more the sentiment of the text and reduced as much as possible information asymmetry. The research paper provides concrete proof that investors can rely on ChatGPT as far as extracting content and summarizing the most relevant information are concerned, minimizing the time and the effort required to complete the same task without this tool (Kim et al., 2023).

These articles are just some examples of the studies that have been conducted to test how ChatGPT can be used to assist in financial research or disclosure but, as mentioned before, this field of study has yet to be fully explored to gain a clear understanding of all the opportunities that this new approach to artificial intelligence has to offer.

However, all these studies (explicitly or not) point out one particular characteristic of ChatGPT. To be precise, most NLP technologies such as ChatGPT are based on artificial neural networks composed of multiple layers of transformers. These transformers are ultimately responsible for the generation of incredibly human-like responses thanks to a mechanism capable of learning the relationship between words and sentences and capturing the main focus of a text (Kalla et al., 2023; Fui-Hoon Nah et al., 2023). Transformers are based on the so-called **self-attention mechanism** that studies the recurrence and the relative centrality of a word in a text to generate a logically structured output sequence that respects the information contained in the input sequence on which the model was trained (Fui-Hoon Nah et al., 2023; Kim et al., 2023; Vaswani et al., 2017). To accomplish this result, it is necessary to rely on a process of **word embeddings**. This process consists of reducing the full dictionary used, which is a high dimensional space, in a lower dimensional space through a mathematical representation of words. In a high dimensional space, it is hard to compare words and establish relationships among them, as a result, it is extremely useful to create a mathematical space in which it is possible to compare words and identify their position inside of a text using simple mathematical operations. Therefore, each word is to be considered as a  $m$ -dimensional vector in this mathematical space. The model recognises each text as a  $n \times m$  matrix, with  $m$  = the dimension of words embeddings, and by proceeding with simple mathematical operations between vectors ChatGPT is capable of computing self-attention scores that enable the system to capture the most relevant information and generate tailored responses (Kim et al., 2023; Vaswani et al., 2017).

This is the basic mechanism that explains why ChatGPT is so appreciated when it comes to summarizing textual information or extrapolating useful observations from complex documents. The research papers discussed above have tested the efficiency of ChatGPT with respect to these aspects. Consequently, without questioning further this particular ability of ChatGPT, giving almost for granted that ChatGPT performs highly in capturing the most relevant pieces of information in a text, there are other aspects that

might be interesting to investigate. As a result, this paper intends to answer the following question: are there any topics that ChatGPT systematically addresses with more emphasis than others when asked to analyse future business plans as described in letters to shareholders?

In doing so, the goal is to feed ChatGPT with letters to shareholders and verify if there are any aspects related to future business plans on which the self-attention mechanism concentrates the most.

### **1.3 FUTURE BUSINESS PLANS DISCLOSURE IN SHAREHOLDER LETTERS**

Before deep diving into the core of our research analysis, it is useful to understand the implications of presenting a general overview of the future business plans in the letters to shareholders.

First of all, it should be considered that firms communicate relevant business and financial information to the public through different channels. If a firm is listed on a stock exchange it is required by the regulatory authorities to disclose formally financial information in the annual report to be published every year. The three primary and mandatory financial statements in the annual report are: balance sheet, income statement and cash flow statement (Hawawini & Viallet, 2019).

It has to be taken into account that annual reports do not necessarily contain only the mandatory financial statements required by regulation, but firms can disclose other voluntary information providing investors and analysts with a more comprehensive overview of the companies' processes, operations and financials (Ferreira & Rezende, 2007).

A form of voluntary disclosure is the letter to shareholders. In fact, shareholder letters are not subject to any type of mandatory requirements (Abrahamson & Amir, 1996) and they have become a really powerful mean to communicate with and inform shareholders and other stakeholders since the early 2000s (Rajan et al., 2023). Typically, letters to shareholders are very short texts in annual reports, with a length of maximum 1 or 2 pages, easy to read and comprehend, that display a general overview of the companies' current financial, operating and investment performance, sometimes in addition to a brief introduction of the firms' future plans and objectives (Kiattikulwattana, 2019).

Due to the fact that letters to shareholders are not constrained by any particular regulation not in terms of content and neither in terms of structure, the CEOs/Chairmen can decide up to their discretion how to reveal past, current and future performance and operations. As a consequence, this characteristic generates the risk of spreading illusory or

inaccurate information or using an extremely optimistic tone that may manipulate the investors' view of the actual condition of the firm and eventually deflect the attention from a severe underperformance (Kiattikulwattana, 2019; Rajan et al., 2023). Despite their voluntary nature, letters to shareholders have gained importance and credibility because they are signed by the CEO and/or the Chairman of the companies, who are held accountable for the information published (Kiattikulwattana, 2019).

Since letters to shareholders are considered to be more easily readable than other voluntary statements such as MD&As (Schroeder & Gibson, 1990), they are accessible to a broader audience. Consequently, there's a cost for the firm of divulging future business plans which is ultimately affected by the multitude of people that have access to this document and can interpret it without a strong economic background (Rajan et al., 2023).

However, annual reports have been criticized for a long time for failing to address completely all the stakeholders' information requirements, particularly by omitting important disclosure about future strategies (Adhariani & De Villiers, 2019; Jensen & Berg, 2012; Lakshan et al., 2021). As a result of a future-oriented disclosure, stakeholders can decide to undertake strategy-specific investments and make decisions that are subordinate to the implementation of the announced future plans which in turn can be profitable also for the company (Ferreira & Rezende, 2007). Furthermore, the voluntary disclosure of forward-looking information on strategies facilitates the evaluation of firm activities and intrinsic value for shareholders (Celik et al., 2006).

In fact, a public disclosure of future intentions bears benefits, such as the reduction of information asymmetry and providing investors with more elements to make valuable assessments and informed decisions, but also costs. Therefore, the CEO/Chairman has to evaluate carefully whether or not revealing its forthcoming plans and projects (Ferreira & Rezende, 2007; Lakshan et al., 2021). A strong announcement in terms of future goals to be accomplished or projects to be implemented necessarily raise expectations across all stakeholders, this situation creates the need to follow up with concrete actions the statements made and live up to those expectations. For example, if a firm declares to make employees' satisfaction and safety a major priority in the next years, but then accidents happen or employees reveal to be more stressed than the previous years, the costs in terms of reputation will consequently be detrimental (Rajan et al., 2023).

Obviously, time machines that allow companies to have a glance at the development of future circumstances do not exist and any prediction is likely to be subject to changes due to unexpected events. Different types of risks may hinder the realization of future goals, that is the reason why shareholders have the right to expect letters to shareholders to display a proper risk assessment and a disclosure of basic risk management practices when

presenting brief statements of future plans (Lakshan et al., 2021). However, divulging too many details around future projects could lead the risk of competitors exploiting this type of information to act accordingly, impacting negatively on the company's future performance (Mathuva, 2015). In addition, statements related to future intentions and projects might give stakeholders the power to pressure further the company (Nagar et al., 2003; Lakshan et al., 2021).

Moreover, another direct consequence of disclosing strategic future plans in letters to shareholders and acting up on the expectations raised is that the management is somehow bounded to follow a certain strategic direction. More precisely, if a future project is announced in a letter to shareholders, a sudden change in strategy would convey the negative message to investors that the original plan was evidently not feasible enough, not structured properly or the company's level of commitment is pretty low. As a result, even when a rethink of the strategy to be adopted would very likely lead to a better outcome, the management is generally reluctant to proceed with it and sticks to the original statements (Ferreira & Rezende, 2007).

Therefore, it is understandable that generally all the information unveiled in letters to shareholders (as well as in all the sections of annual reports) has always referred mainly to the financial and operating implications of operations and transactions already occurred, rather than introducing properly future projects and forecasts. There have always been conflicting opinions on this issue. Some endorse the notion that including a more or less detailed presentation of future plans and financial forecasts can enhance the value of this disclosure for investors and stakeholders at large. Conversely, there is a more conservative view that embraces the idea that those future projections may compromise the objectivity of the financial statements and generate more costs than benefits for the company (Abrahamson & Amir, 1996). Thus, manifesting future intentions in letters to shareholders can be a valuable piece of information for stakeholders, however this type of data cannot be verified until the announced plans are actually implemented, raising doubts as far as the objectivity and credibility of these types of announcements are concerned (Ferreira & Rezende, 2007).

At the same time, it is not to be underestimated the role that an appropriate tone in disclosure has in shaping investors' perspectives towards future opportunities and threats. More specifically, when a company's current performance is low, the letters to shareholders should present a more optimistic point of view towards the future to retain and attract investors. Otherwise, if the company is actually performing well financially, the letters to shareholders should include also more realistic observations about future

challenges without resulting extremely overconfident in order to raise investors' trust (Emett, 2019).

Bearing all these insights in mind, we should be able to answer the question: how do companies deal with the mitigation of risk uncertainty associated with a future-oriented disclosure? Companies opt for an extremely generic future-oriented disclosure that contains little or no quantitative information (Lakshan et al., 2021). Quantitative disclosures are indeed riskier than qualitative ones, as stakeholders can easily compare quantitative data and use it to hold the company accountable for its statements (Menicucci, 2018). That explains why letters to shareholders dedicate only few sentences to the announcement of future plans. It is the attempt made by CEOs/Chairmen to protect the company from the risk of being held accountable for not achieving the stated results/objectives, leading investors to call for litigation against the firm (Lakshan et al., 2021).

## CHAPTER 2

### METHODOLOGY

#### 2.1 DATA COLLECTION AND ANALYSIS STRUCTURE

Since the advent of ChatGPT people have developed a growing interest in exploring the different ways in which it's possible to exploit this new AI technology (Beckmann et al., 2024). The following research aims to investigate the capabilities of ChatGPT 4.0 in analysing the future business plans as delineated in the letter to shareholders included in the 2023 annual reports of companies listed on the EuroNext Milan market. More specifically, the goal is to ask ChatGPT several questions and study which topics ChatGPT considers and analyse and what are the elements that it does not consider. To facilitate a comprehensive analysis, 30 companies among the ones listed on EuroNext Milan market (FTSE Italia All-Share index) have been selected to make a representative sample of data with companies involved in a broad spectrum of industries. Moreover, it goes without saying that the selection requisite must be the presence of a shareholder letter within their 2023 annual report. Another aspect that has to be clarified is that the choice of focusing on the year 2023 is not casual, but it's actually a strategic decision. As ChatGPT has no access on the information and events pertaining to 2024 (Hua et al., 2024), with the question being related to future plans not yet enacted by the companies, we are mitigating the risk of ChatGPT relying on sources other than the provided shareholder letters when formulating its responses.

The 30 companies selected are:

1. A2A s.p.a.
2. Abitare In s.p.a.
3. ACEA s.p.a
4. Aeroporto Guglielmo Marconi Di Bologna s.p.a.
5. Alkemy s.p.a
6. Amplifon s.p.a.
7. Anima Holding s.p.a.
8. Ariston Holding s.p.a.
9. Avio s.p.a.
10. Banca Generali s.p.a.
11. Banca IFIS s.p.a.
12. Bca profilo s.p.a.
13. Beghelli s.p.a.
14. BFF bank s.p.a.

15. BPER banca s.p.a.
16. Brembo s.p.a.
17. Brunello Cucinelli s.p.a.
18. Carel Industries s.p.a.
19. Cementir Holding s.p.a.
20. Civitanavi Systems s.p.a.
21. ENI s.p.a.
22. Ferrari s.p.a.
23. Fincantieri s.p.a.
24. Leonardo s.p.a.
25. Moncler s.p.a.
26. Mondadori s.p.a.
27. Newlat food s.p.a.
28. Nexi s.p.a.
29. Piaggio s.p.a.
30. Reply s.p.a.

Once selected only the letter to shareholders from the 2023 annual report for each company, it has to be uploaded to ChatGPT to give the AI the content we expect it to work on. Consequently, the research methodology involves presenting ChatGPT with three distinctly focused questions related to the prospective business strategies discussed in the shareholder letters by the chairman/CEO of each company.

These questions are designed to evaluate:

1. Strengths and weaknesses of the future business plans announced by the company in their letter to shareholders.
2. The aspects that the company is lacking in considering or examining appropriately to present and structure a business plan.
3. Risk management practices and concerns.

Therefore, the three tailored questions are:

1. “This is the letter to shareholders from the 2023 annual report of the company. Based on the information that can be acquired from the letter, does the company reveals any future business plan to be implemented? If the answer is yes, comment on the strengths and the weaknesses of the future plans described.”.
2. “Are there any aspects the company is not taking into consideration or examining further in presenting its future business plans?”

3. “Does the letter provide information related to risk management for its future business plans? If not, what the company should consider in order to address the issue?”

In the attempt to study how does ChatGPT cope with these specific matters, as Kothari et al.’s (2009) identified six lists with the main business key words, it’s crucial to identify the specific themes that should be addressed when dealing with future business plans. The six groups of words identified by the mentioned work are as follows: “statements on market risk, industry structure and competitive forces; statements on firm-level strategy intent, innovation and R&D, product market performance and performance of the business strategy model in use; statements on human and organizational capital, quality of management performance, and corporate governance and leadership; statements on market recognition, power and consistency of branded image, measures of consumer confidence and trust in branded image; statements on the corporate and business unit’s financial performance; and statements and/or references to government regulations enacted or pending influential to firm competitiveness, product market performance and/or disclosure practices” (Kothari et al., 2009).

Drawing inspiration from the mentioned seminal work of Kothari et al., for the purpose of our analysis, a realistic hypothesis is that a brief description of a future business plan should ideally touch upon at least several critical themes summarized in the following categories (in no particular order of importance):

1. RISK MANAGEMENT PRACTISES
2. FINANCIAL IMPLICATIONS
3. STAKEHOLDERS ENGAGEMENT
4. DIGITALIZATION AND TECHNOLOGICAL ADVANCEMENT
5. COMMITMENT TO SUSTAINABILITY PRACTICES

In an effort to quantitatively assess the alignment of ChatGPT’s responses with these thematic categories, it is useful to consider a predefined set of keywords representative of each category and measure the frequency of these keywords in ChatGPT’s responses to determine ChatGPT 4.0’s focus in addressing the specified themes. Specifically, the frequency is measured by computing the ratio between the words selected and the total amount of words generated for each answer.

The words selected for each category are as follows:

1. RISK MANAGEMENT: risk(s);
2. FINANCIAL IMPLICATIONS: finance(s)/financial, credit, debt(s), revenue(s), cost(s), profit(s)/profitability/profitable;



3. STAKEHOLDERS ENGAGEMENT: stakeholder(s), shareholder(s), customer(s)/consumer(s)/client(s), employee(s), supplier(s), investor(s);
4. DIGITALIZATION AND TECHNOLOGICAL ADVANCEMENT: technology(/ies)/technological, digital/digitalization, cybersecurity, AI;
5. COMMITMENT TO SUSTAINABILITY: sustainable/sustainability, environment/environmental(ly), green, climate, ESG, social, governance, (de)carbon(ization), circular.

Obviously, it is irrational and impossible to consider all the existent key words related to these specific themes, but the ones above mentioned constitute a good sample that detects whether or not the answers provided by ChatGPT touch these specific aspects and with which frequency. The choice of selecting a wider range of words rather than just a single word for each category allows to detect the presence of a specific theme even when the artificial intelligence replies using synonyms or different words, e.g.: instead of mentioning explicitly the word “sustainability”, it mentions “circular economy”, a sustainable practice used by companies to increase their ESG ratings and minimize their environmental impact.

Indeed, the analysis conducted through pre-selected keywords does have inherent limitations. For example, a specific subject matter may still be discussed employing a different terminology, thus, potentially leading to a lack in precision. For this reason, the quantitative analysis is going to be supported by a qualitative review of selected response examples, in order to provide an appropriate outlook on how ChatGPT answers to the specified questions.

- Furthermore, it can serve the purpose of this study to analyse the most important statistical measures and the dispersion of the observations within each category and repeat the process for all the results related to each of the three questions. The statistical measures that are going to be considered are: the mean, the minimum and maximum value, the standard deviation and the coefficient of variation. In particular, the mean values obtained provide insights on which categories, on average, have received more or less attention across all the responses to each question. Moreover, employing dispersion metrics allows to understand whether the same emphasis (quantified as the frequency ratio) posed to a certain theme in a response is similar to the focus observed in other responses to the same question. In order to do so, there are several computational steps to follow. Firstly, it is necessary to compute the average ratio for each thematic category (the mean). Then, we compute the standard deviation for each category. The standard deviation is defined as the

average deviation of a set of numbers with respect to the mean and it can be computing using the formula (Sarkar & Rashid, 2016)

$$\sigma = \sqrt{\frac{\sum (x_i - \bar{x})^2}{n-1}} \text{ with:}$$

- $x_i$  = each specific value from the sample
- $\bar{x}$  = mean
- $n$  = number of observations.

This metric alone would be sufficient to gauge the dispersion. However, to better ascertain whether a particular  $\sigma$  is significant or not, we can compute a variability index called “coefficient of variation” given by the ratio between the standard deviation obtained and the relative mean of the data set. The coefficient of variation confronts the standard deviation and the mean and consequently, as a general rule of thumb, if the coefficient of variation is lower than 1 there’s little dispersion among the data, suggesting that at least the standard deviation is of a small percentage lower than the mean, if the index is higher than 1 it indicates that the dispersion is significantly high.

To conclude, this research aims not only to test the analytical effectiveness of ChatGPT 4.0 but also to contribute to the understanding of AI's utility in strategic business analysis. This approach enables the assessment of whether AI can identify and emphasize aspects of business strategy that are traditionally valued in corporate analysis, such as risk management and stakeholder engagement. By doing so, it seeks to offer valuable insights into the capabilities and limitations of AI technologies in interpreting and extrapolating meaningful information from business documents and strategies. If AI can reliably analyse complex strategic documents, it could serve as a valuable tool for executives and analysts, offering rapid insights that might otherwise require a lot of time and extensive human effort. Furthermore, identifying any biases or gaps in AI’s analysis could help in refining AI tools for a better alignment with human analytical processes.

## CHAPTER 3

### EMPIRICAL ANALYSIS

#### 3.1 STRENGTHS AND WEAKNESSES OF FUTURE BUSINESS PLANS THROUGH THE LENSES OF CHATGPT 4.0

##### 3.1.1 Quantitative analysis

Since the dawn of time, the meticulous evaluation of qualitative documents, such as articles or letters, has been considered exclusive domain of human intellect and capabilities. This task requires not only an understanding of textual content but also an analysis of more implicit contextual and strategic implications. Nowadays, new possibilities have opened up, and artificial intelligence threatens to replace human beings in particular in the analysis and generation of logical textual content. In this research, we proceed to entrust ChatGPT with the critical task of discerning the strengths and weaknesses embedded within strategic announcements made by the chairpersons or presidents of companies of future business plans. These announcements are often encapsulated in few sentences of the letters to shareholders, which makes the task for ChatGPT 4.0 even more complex

By providing ChatGPT with a question in which we ask a NLP technology to discern **strengths and weaknesses** of an announcement related to future perspectives and plans made by the chairman/president of a company in a small part of the 2023 annual report, we have the intention to investigate whether the answers provided are reliable and the extent to which they take into account the most crucial topics mentioned in the previous chapter of this work.

This paragraph is structured in order to:

- First, determine the extent to which ChatGPT can engage with and reflect upon the most critical themes previously identified in our study—themes that encompass risk management, financial implications, stakeholder engagement, technological advancement, and sustainability.
- Second, assess the reliability of the responses generated by this AI technology—whether they merely replicate surface-level information or genuinely delve into the analytical depth that this evaluation requires.

In *Table 1*, the results generated by quantifying the frequency of themed-specific words relative to the total volume of words in the AI-generated responses are portrayed, while *Table 2* summarises all the relevant statistical measures associated with the observations from *Table 1*.

Table 1 – ratio between themed-specific words and total amount of words generated per answer (first question)

|                                     | RISK   | FINANCIAL IMPLICATIONS | STAKEHOLDERS ENGAGEMENT | DIGITALIZATION AND TECHNOLOGY | SUSTAINABILITY |
|-------------------------------------|--------|------------------------|-------------------------|-------------------------------|----------------|
| A2A s.p.a                           | 0,0061 | 0,0122                 | 0,0143                  | 0,0061                        | 0,0204         |
| Abitare In s.p.a                    | 0,0131 | 0,0175                 | 0,0131                  | 0,0109                        | 0,0044         |
| ACEA s.p.a                          | 0,0109 | 0,0054                 | 0,0054                  | 0,0127                        | 0,0091         |
| Aeroporto G. Marconi Bologna s.p.a. | 0,0157 | 0,0105                 | 0,0105                  | 0,0183                        | 0,0157         |
| Alkemy s.p.a                        | 0,0066 | 0                      | 0,0198                  | 0,0132                        | 0              |
| Amplifon s.p.a.                     | 0,0064 | 0,0021                 | 0,0192                  | 0,0064                        | 0,0171         |
| Anima Holding s.p.a.                | 0,0069 | 0,0069                 | 0,0092                  | 0                             | 0,0138         |
| Ariston Holding s.p.a.              | 0,0086 | 0                      | 0,0043                  | 0,0151                        | 0,0215         |
| Avio s.p.a.                         | 0,0104 | 0,0062                 | 0,0021                  | 0,0207                        | 0,0187         |
| Banca Generali s.p.a.               | 0,0042 | 0,0042                 | 0,0106                  | 0                             | 0,0317         |
| Banca IFIS s.p.a.                   | 0,0063 | 0,0146                 | 0,0146                  | 0,0229                        | 0,0333         |
| Bca profilo s.p.a.                  | 0,0042 | 0,0042                 | 0,0148                  | 0,0211                        | 0,0169         |
| Beghelli s.p.a.                     | 0,0103 | 0,0021                 | 0,0041                  | 0,0041                        | 0,0082         |
| BFF bank s.p.a.                     | 0,0027 | 0,0214                 | 0,0134                  | 0,0107                        | 0              |
| BPER banca s.p.a.                   | 0,0077 | 0,0077                 | 0,0230                  | 0,0179                        | 0,0153         |
| Brembo s.p.a.                       | 0,0117 | 0,0047                 | 0,0047                  | 0,0187                        | 0,0094         |
| Brunello Cucinelli s.p.a.           | 0,0162 | 0                      | 0,0070                  | 0,0093                        | 0,0116         |
| Carel Industries s.p.a.             | 0,0088 | 0,0155                 | 0,0022                  | 0,0265                        | 0,0177         |
| Cementir Holding s.p.a.             | 0,0132 | 0,0088                 | 0,0022                  | 0,0110                        | 0,0132         |
| Civitanavi Systems s.p.a.           | 0,0127 | 0,0127                 | 0                       | 0,0253                        | 0,0177         |
| ENI s.p.a.                          | 0,0030 | 0,0060                 | 0                       | 0,0240                        | 0,0150         |
| Ferrari s.p.a.                      | 0,0049 | 0,0024                 | 0,0049                  | 0,0146                        | 0,0195         |
| Fincantieri s.p.a.                  | 0,0161 | 0,0069                 | 0                       | 0,0138                        | 0,0206         |
| Leonardo s.p.a.                     | 0,0155 | 0,0103                 | 0                       | 0,0284                        | 0,0232         |
| Moncler s.p.a.                      | 0,0048 | 0                      | 0,0095                  | 0                             | 0,0190         |
| Mondadori s.p.a.                    | 0,0040 | 0,0020                 | 0                       | 0,0180                        | 0,0080         |
| Newlat food s.p.a.                  | 0,0118 | 0,0118                 | 0,0024                  | 0                             | 0,0166         |
| Nexi s.p.a.                         | 0,0076 | 0,0025                 | 0,0051                  | 0,0202                        | 0,0227         |
| Piaggio s.p.a.                      | 0,0067 | 0,0067                 | 0,0045                  | 0,0224                        | 0,0157         |
| Reply s.p.a.                        | 0,0068 | 0,0023                 | 0                       | 0,0522                        | 0,0023         |

Table 2 – Key statistical measures (first question)

|   | RISK   | FINANCIAL IMPLICATIONS | STAKEHOLDERS ENGAGEMENT | DIGITALIZATION AND TECHNOLOGY | SUSTAINABILITY |
|---|--------|------------------------|-------------------------|-------------------------------|----------------|
| MEAN ( $\mu$ )                            | 0,0088 | 0,0069                 | 0,0074                  | 0,0155                        | 0,0153         |
| MINIMUM (min)                             | 0,0027 | 0                      | 0                       | 0                             | 0              |
| MAXIMUM (MAX)                             | 0,0162 | 0,0214                 | 0,0230                  | 0,0522                        | 0,0333         |
| STANDARD DEVIATION ( $\sigma$ )           | 0,0041 | 0,0056                 | 0,0066                  | 0,0108                        | 0,0079         |
| COEFFICIENT OF VARIATION ( $\sigma/\mu$ ) | 0,4657 | 0,8106                 | 0,9016                  | 0,6987                        | 0,5190         |

After a first examination, it is possible to observe that the tables highlight a significant focus by ChatGPT on contemporary issues such as digitalization and sustainability, reaching the highest mean values of about 0,0155 and 0,0153 respectively. This result is due to the fact that companies themselves pose a pronounced emphasis on these matters since the global attention and the new challenges that companies are called to face require a higher sensitivity to sustainability matters and a more technological/digital approach. In fact, it's no surprise that companies, driven by the dual forces of market demand and regulatory expectations, are increasingly prioritizing innovative technological strategies and sustainable practices. These shifts in corporate focus are reflected in the content of the letters to shareholders and in the preannounced future business plans that aim to align corporate strategies with these evolving external demands.

Therefore, the greater attention by ChatGPT has indeed been given to digitalization and technology. The greatest prevalence of technology-related keywords unsurprisingly occurs in the response pertaining to Reply S.p.A., a digital services firm. Moreover, among all the 30 companies, only for 4 companies it didn't focus on the mentioned topic, meaning that in 86,67% of the cases ChatGPT has focused on discussing the increased integration of digital technologies and technological innovations, hence also highlighting the constant necessity of investing in R&D to keep up with the latest trends in each industry. This observation suggests that AI recognizes the critical role of technological advancement in driving business growth and adaptation.

The second theme where it poses considerable attention is sustainability (mean: 0,0153). For 28/30 companies (93,33%) it considered sustainability matters in discussing the strengths and the weaknesses of the proposed business plans even in cases in which a more explicit mention of the topic was absent. ChatGPT's ability to largely discuss this topic (even without an explicit mention of how sustainability is accounted for in implementing the strategic future plans announced) surely suggests that it recognizes market trends and contemporary business priorities. The highest ratio of sustainability-related keywords to the total word count in the responses is observed in the analysis provided for Banca IFIS S.p.A.. In this particular case, ChatGPT recognizes that the letter to shareholders of this firm contains information about future strategic initiatives focused on enhancing its digital transformation, bolstering its commitment to ESG principles, and increasing its product innovation, particularly in sustainable finance and green financing solutions. In addition, the AI categorizes as "strengths" the bank's intention to develop projects with significant social impacts and to enhance climate risk monitoring within its risk management processes. Furthermore, ChatGPT highlights the firm's proactive approach in developing financial products to support sustainable practices, which

potentially leads to certain positive outcomes for the bank, such as the attraction of new customer segments and the penetration in new markets.

As far as Risk Management and Financial Implications are concerned, while these areas also are addressed in the majority of the cases, they do not reach the same emphasis as the aforementioned categories.

More precisely, within the domain of the Risk Management category, we can see that the term “risk” appears consistently across ALL the responses generated by ChatGPT 4.0, with an average occurrence of about 0,0088 with respect to the total number of words generated per answer. In analysing strengths and weaknesses, the AI systemically considers the potential risks associated with the implementation of each future business plan. However, it is important to note that ChatGPT does not consider all the possible different risks, but predominantly focuses on the ones which it perceives to have a significant future impact. Furthermore, it does not provide the readers with detailed explanations on how to structure a proper risk management framework, unless explicitly requested. For instance, consider the cases with the minimum and maximum ratios for the occurrence of the word “risk”, respectively: BFF bank s.p.a. (0,0027) and Brunello Cucinelli (0,0162). In the response related to strengths and weaknesses of BFF bank’s future plans in the shareholder letter, the term “risk” appears twice in the analysis of the weaknesses of the plans. Specifically, it mentions the market risk associated with geographic expansion due to local market dynamics, adaptation to different regulations and cultural differences, and it also addresses the execution risk linked to resource management. Conversely, in the response that ChatGPT gives with respect to the letter to shareholders of Brunello Cucinelli, it acknowledges a broader spectrum of risks among the weaknesses of the future plans. This includes market risk due to the high dependence on the luxury fashion market that makes the firm extremely susceptible to economic fluctuations, operational risks linked to the increasing number of investments the company plans to undertake and geopolitical risks pertinent to their expansion in China and Mexico.

Additionally, the first thing to evaluate when analysing a future business plan is its financial feasibility and its impact on the company’s overall financial health. ChatGPT addresses the issue, and it generally acknowledges how crucial it is to always present and clearly explain the financial implications behind every project, in fact, it frequently identifies the omission of financial impact considerations as a critical weakness in business plans. Analytically, the mean frequency with which the selected financial keywords occur in each response is about 0,0069 and it mentioned the financial keywords in 86,67% of the cases (26 out of 30 responses for each company).

Finally, it has to be considered the category of Stakeholder's Engagement. This category is less emphasized with respect to digitalization and sustainability, despite the broad range of words used for its analysis. The average ratio computed is around 0,0074, which is still above the average frequency of financial-related keywords.

Overall, the data presented in *Table 1* and in *Table 2* effectively delineates how ChatGPT prioritizes and processes certain key business themes in its output. Given that this generative AI is not capable of independently formulate financial forecasts without predefined formulas or a trend series, it does not surprise that it isn't extremely precise when dealing with the financial aspects of a future business plan. Nonetheless, the insights that it generates can always serve as a starting point to make sure the essential elements are considered in the evaluation of a future strategic plan. Moreover, the pronounced emphasis on sustainability and digital transformation aligns with the shifting paradigms observed within the corporate world.

Finally, to ascertain whether ChatGPT considers more or less uniformly a category among all the observations, it is necessary to refer to a dispersion measure: the standard deviation. *Table 2* displays the standard deviation and the coefficient of variation, computed on the figures illustrated in *Table 1*. The standard deviation measures the average dispersion of the observations towards the mean for each category, but in order to establish if the dispersion is actually low or high, it can be useful to compare directly the standard deviation with the mean. Therefore, it is useful to consider the coefficient of variation. As preannounced in chapter 2, it is said that if the coefficient of variation is lower than 1, then the dispersion can be considered reasonably low, otherwise it has to be considered high. This is a useful approximation for the purpose of this study. From *Table 2*, it emerges that the values computed for the coefficient of variation are all smaller than 1 and range from about 0,4657 to 0,9016. The meaning of this ratio is that at least the standard deviation does never exceed the value of the mean. Consequently, it suggests that the dispersion across the responses relative to each category is not excessively large. Relatively, it does not surprise that the highest dispersion is recorder for the categories of "Financial Implications", "Stakeholders Engagement" and "Digitalization and Technology" which exhibit a higher frequency of values equal to 0 in *Table 1*. However, it is possible to conclude that having a low dispersion index means that ChatGPT generally addresses same topics with a similar frequency. It is evident that this generative AI is capable of adjusting its responses to the specificities of the subject of the query, but these statistical results also highlight that there are certain themes it systematically considers more than others across different contexts.

### 3.1.2 Qualitative analysis

At this point, beside the quantitative evidence presented, it is instructive to show and elucidate the underlying logic employed by ChatGPT in generating its responses to the query: “(...) Based on the information that can be acquired from the letter, does the company reveals any future business plan to be implemented? If the answer is yes, comment on the strengths and the weaknesses of the future plans described.”. The reliance on specific keywords does not provide the most precise analysis because there’s the risk of overlooking discussions that do not use these terms but still address the themes in question. Therefore, while this data offers valuable insights from a general point of view, it should be complemented with a deeper qualitative analysis. In order to do so, it could be useful to provide the readers with practical examples of the answers generated.

*Image 1* showcases two distinct examples of responses related to the shareholder letters of the companies Amplifon s.p.a. and Mondadori Editore s.p.a., respectively (next page).

The first feature that can be highlighted is related to the structure of the responses which is the same for both cases. The consistency in response structure might be attributed to the AI's learning mechanism. ChatGPT basically synthesizes information from its past interactions. In fact, it tends to standardize its response format based on the input provided. If no changes are applied to the input across different instances, ChatGPT replicates the same structural template for its outputs, irrespective of the varying contexts it is applied to (in this case, independently from the different information provided by the diverse letters to shareholders of the 30 companies). Firstly, the answer presents a brief overview of the various factors the company intends to prioritize in the future: the so called “Future Business Plans” section. Rather than focusing on a specific business plan, the AI identifies the most strategical areas for the companies to strengthen or focus on the future based on the information it acquires from the letter to shareholders.

Following this short and summarizing paragraph, the response is organised into two different paragraphs distinctively one about the strengths and the other about the weaknesses. However, while the structure is replicated for each response, the content varies depending on the specific information extracted from each company’s shareholder letter. This approach underscores the AI's capability to tailor its analytical focus to the unique elements presented in each document, highlighting different strategic aspects.

Let’s have a look first at the Amplifon’s case. The 2023 letter to shareholders not only provides a brief summary of the financial and operational results obtained throughout the year compared to previous years, but also outlines the company’s plans for expansion and



growth for the 2024. The letter indicates that in 2023 a lot of operations like bolt-on acquisitions were put in place to expand Amplifon’s global network and the letter hints the readers that the same path will be followed in the future to ensure a rapid growth of

Image 1 – ChatGPT’s “strengths and weaknesses of future plans” responses for Amplifon S.p.A and Mondadori S.p.A.

|   |   |
|---|---|
| <p>Yes, the letter to shareholders from the 2023 annual report of Amplifon reveals several future business plans that the company intends to implement. Here’s a summary of these plans along with an analysis of their strengths and weaknesses:</p> <p><b>Future Business Plans</b></p> <ol style="list-style-type: none"> <li><b>Expansion through Acquisitions:</b> Amplifon plans to continue its growth strategy through acquisitions, as evidenced by the purchase of over 340 new points of sale and more than 100 stores in early 2024, especially in the United States and China.</li> <li><b>Innovation and Customer Experience Enhancement:</b> The company is rolling out new technologies like Otopad audiometers across stores and revamping store formats to enhance customer experience.</li> <li><b>Sustainability Initiatives:</b> Amplifon is committed to increasing its sustainability efforts, which include setting science-based decarbonization targets, increasing the use of renewable energy sources, and engaging in social responsibility initiatives.</li> <li><b>Employee Development and Diversity Initiatives:</b> The company plans to continue investing in employee training and enhancing diversity within its workforce, as part of its broader DEIB (Diversity, Equity, Inclusion, and Belonging) policies.</li> </ol> <p><b>Strengths of the Future Plans</b></p> <ol style="list-style-type: none"> <li><b>Robust Growth Strategy:</b> The aggressive expansion through acquisitions and opening of new sales points positions Amplifon well for capturing a larger market share, especially in key markets like North America and China.</li> <li><b>Focus on Innovation:</b> By integrating advanced technologies and enhancing store formats, Amplifon is poised to improve the customer experience, potentially increasing customer satisfaction and loyalty.</li> <li><b>Commitment to Sustainability:</b> The initiatives related to sustainability and social responsibility not only improve the company’s corporate image but also align with global trends and consumer preferences toward environmentally responsible businesses.</li> <li><b>Investment in Human Capital:</b> The focus on training and diversity can improve employee morale and productivity, and position Amplifon as a desirable place to work, attracting and retaining top talent.</li> </ol> <p><b>Weaknesses of the Future Plans</b></p> <ol style="list-style-type: none"> <li><b>Integration Risks:</b> The rapid pace of acquisitions could pose challenges in terms of integration, both culturally and operationally, potentially leading to inefficiencies or dilution of company values.</li> <li><b>Market Volatility and Economic Dependency:</b> As Amplifon expands, its dependence on the global market dynamics increases, making it susceptible to economic downturns and geopolitical tensions that could affect its core markets.</li> <li><b>Scalability of Sustainability Initiatives:</b> While ambitious, the sustainability targets require significant resources and coordination. There’s a risk that these initiatives might not scale as planned or deliver the intended environmental and social benefits.</li> <li><b>Competition and Innovation Pressure:</b> The hearing care market is becoming increasingly competitive with many players investing heavily in technology and customer experience. Amplifon needs to continuously innovate to maintain its competitive edge, which could strain resources.</li> </ol> <p>Overall, Amplifon’s future plans show a clear strategy aimed at growth, innovation, and sustainability. However, careful management of expansion risks, continuous innovation, and genuine commitment to sustainability will be key to achieving these plans successfully.</p> | <p>Yes, the letter to shareholders from the 2023 annual report of the Mondadori Group reveals several aspects of the company’s future business plans. Here is a breakdown of the strengths and weaknesses of these future plans:</p> <p><b>Future Business Plans</b></p> <ol style="list-style-type: none"> <li><b>Consolidation and Expansion in Book Publishing:</b> Mondadori is focusing on consolidating its presence in the book publishing sector, especially in trade books and school textbooks, and expanding its operations through acquisitions, such as the 51% stake in Star Shop.</li> <li><b>Digital Transformation in Media:</b> The company is capitalizing on the growth opportunities in the digital media space, which is helping to offset the downturn in print media revenues.</li> <li><b>Strengthening Retail Operations:</b> Mondadori continues to optimize and develop its network of bookshops across Italy, enhancing their role as cultural hubs.</li> <li><b>Commitment to Sustainability and Diversity:</b> The company emphasizes its ongoing efforts to enhance sustainability, diversity, and inclusion within its operations.</li> </ol> <p><b>Strengths of the Future Plans</b></p> <ol style="list-style-type: none"> <li><b>Strategic Focus on Core Business:</b> By concentrating on book publishing, where it already has a strong foothold, Mondadori can leverage its existing assets and expertise to solidify its market leadership.</li> <li><b>Leveraging Digital Media:</b> The focus on growing and leading in high-value digital media segments allows Mondadori to adapt to changing consumer behaviors and technological advancements, potentially increasing its market reach and revenue streams.</li> <li><b>Enhancing Retail Experience:</b> Optimizing the bookstore network not only serves as a direct sales channel but also strengthens the brand’s presence and customer engagement.</li> <li><b>Emphasis on Corporate Responsibility:</b> Commitment to diversity, inclusion, and sustainability aligns with global corporate trends and can improve the company’s public image and employee satisfaction.</li> </ol> <p><b>Weaknesses of the Future Plans</b></p> <ol style="list-style-type: none"> <li><b>Challenges in Print Media:</b> Despite a strategic pivot to digital, the ongoing downturn in print media remains a significant challenge, with potential long-term revenue impacts if not managed effectively.</li> <li><b>Integration Risks:</b> The integration of newly acquired businesses like Star Shop presents operational and cultural integration challenges, which could affect overall efficiency and profitability.</li> <li><b>Market Volatility:</b> The plans might be overly optimistic about growth and profitability amidst unstable macroeconomic conditions and geopolitical challenges, which could affect consumer spending and investment returns.</li> <li><b>Resource Allocation:</b> Continuous investment in digital transformation and acquisitions requires significant resources. There is a risk that these investments may not yield expected returns, impacting financial stability.</li> <li><b>Dependence on Italian Market:</b> With a strong focus on the Italian market, the company may be overly exposed to local economic fluctuations and might miss out on opportunities in global markets.</li> </ol> <p>In summary, the Mondadori Group’s future business plans are robust, focusing on leveraging strengths in book publishing and digital media, while also addressing societal and environmental responsibilities. However, integrating new acquisitions, managing declining print media revenues, and navigating economic uncertainties are to be carefully managed to ensure successful implementation of these plans.</p> |
|---|---|

the company. Specifically, the letter states that 2024 is going to be a year characterised by several M&A acquisitions, as evidenced by the acquisition of over 100 stores in the first quarter of the year, mainly acquired in the United States. On the basis of this information, in the brief overlook about the future business plans to be implemented, as

observable in *Image 1*, we expect the AI to detect and consider this piece of information. Coherently with our expectations, ChatGPT does consider this piece of information. Furthermore, accordingly to the request related to the individualization of strengths and weaknesses, it analyses this expansion plan both considering positive and negative aspects that can be associated to this strategy.

More specifically, the AI categorizes as “strength” the attempt to grow and reach a higher market share through an aggressive strategy of acquisitions, while it considers as “weaknesses” the threats of a high dependence on global market volatility, highlighting the negative impact a global economic downturn or the geopolitical tensions can have on such a business. Additionally, the AI notes the possible inefficiencies that may derive from a rapid and enormous expansion especially in terms of efficient adaptability and operational and cultural integration. By providing this meticulous analysis, ChatGPT demonstrates its ability to deliver a comprehensive evaluation of Amplifon’s strategic plans, balancing the potential advantages of an aggressive growth strategy with the associated risks and challenges.

Considering only the expansion plan they intend to pursue, it’s possible to draw two different conclusions. The first is positive: ChatGPT proved to be able to extract a small specific piece of information from an entire text and identify several possible consequences discerning positive ones (“strengths”) from negative ones (“weaknesses”). However, the second conclusion is much more disillusioned because the response was extremely general (and this can be attributed to the fact that it answers to an extremely general question) but it does not take into consideration several aspects. For instance the fact that, even though it’s true that a more vast presence globally for a company means to be more sensible to global geopolitical tensions and economic downturns, at the same time, it means geographically diversifying the business and being less dependent on local economic downturns and also governmental issues, besides the positive aspect of having a global presence for sales and the instauration of global networks.

Moreover, the response strongly focuses on highly discussed topics in letters to shareholders like the continuous commitment to sustainability practises and the effort to enhance the technological and digital performance of the company’s processes. It’s of no surprise that those topics are repeatedly presented in the answers when ChatGPT is asked to evaluate strengths and weaknesses that emerge from a given text. Generally, analysts, investors and all the people in general are used to read a lot of statements about sustainability and innovation in letters to shareholders with the promise of pursuing social, environmental and governance practises, introducing new accessible technologies for their products, operational processes and to share the value proposition with stakeholders in a

more rapid, effective and accessible way, and the commitment to continuously pushing for an improvement in both cases to align with the global demand and to attract capital and investors.

Specifically, in Amplifon's case, ChatGPT focalised the attention to the benefits that can derive from introducing more advanced and concrete sustainability targets to reach like the setting of decarbonization targets (according to and taking practical and efficient measures to become more environmentally responsible like a better exploitation of renewable energy sources. These practices have been obviously classified among the "strengths" because they highlight the company effort not only in reducing its environmental footprints but also they play a significant role in enhancing the corporate image and increasing stakeholder trust. At the same time, the AI recognizes that pursuing those targets requires the exploitation of an incredible number of resources and investments, but it seems to not be considering the announcement in the letter of the introduction of a new Sustainability Plan, neither comments on the fact that the letter anticipates that its medium and long-term targets are going to be integrated with the company's business and financial strategy (although the letter does not describe properly what the plan consists of and how it is intended to be integrated with the business and financial strategy). A more nuanced analysis would consider how these specific sustainability initiatives contribute to long-term business resilience and enhance brand reputation. Additionally, the discussion could delve into how technological and digital advancements improve operational efficiency, customer experience, and competitive positioning.

This leads the way to a much more significant observation. Generally, if not mentioned explicitly in the text, the Ai rarely gets specific on financial aspects related to the announced operations to be implemented. In Amplifon's letter to shareholders, in fact, we do have a brief mention of the M&A strategies that were pursued in 2023, and the intention to continue this expansion path also in the future. However, the letter does not provide any more specific insight and analysis or comment on how these strategies are going to impact the company's financial health and cost and risk management. This observation aligns with the relatively low mean ratio displayed in *Table 1*. In fact, ChatGPT lacks in presenting a more accurate financial analysis to properly address all the aspects concerning the future business plan (particularly to ensure a company's financial health and competitiveness).

Shifting the focus from Amplifon's case to the Mondadori's one, it has to be mentioned that in the letter to shareholders from the 2023 annual report, it emerges that the company has the intention to continue the efforts in consolidating its position within

the realms of book publishing and fashion. Moreover, the company expresses its commitment to always pay a special attention to issues related to diversity, inclusion, ESG and the employees' well-being. Nonetheless, the description lacks detailed exposition on the specific actions the company plans to undertake to achieve these objectives, merely stating intentions without elaborating on execution strategies.

In the assessment of the stronger and the more vulnerable elements of the future strategies the company states to adopt in the future, ChatGPT primarily focuses its analysis on evaluating directly the company's proposals, although sometimes it does not investigate further other collateral effects these strategies can have (for instance, impact on stakeholders, the company's financial projections, or risk management practices).

For instance, ChatGPT identifies among the strengths the company's strategic decision to focus on its core business (book publishing), emphasizing the fact that this strategy is likely to help the company consolidate its market leadership and exploit properly the existing assets and its *know-how* and expertise.

Similarly to the response related to Amplifon's shareholder letter, the AI consistently considers sustainability and technological matters, but on the contrary this time it offers a more critical observation regarding the financial impact in the "weaknesses" section.

In fact, it touches on the risks associated with intensive M&A activities and resource allocation for digital transformation, pointing out the possibility that these investments may drain useful resources without guaranteeing the desired returns. Moreover, it argues that, due to a high market volatility and its strong dependence on the Italian market, it might be too optimistic to expect an enhanced growth and increased profitability. Finally, the artificial intelligence implicitly suggests managing properly the risks associated with Print Media. In fact, this is due to the fact that Digital Media is threatening to substitute any form of traditional media physically printed on paper or other materials, highlighting that failing to effectively navigate this evolving landscape could affect long-term financials (even though the company is engaging in new projects and initiatives in the digital media business). These statements in the text are particularly interesting because they demonstrate how from a knowledge of the Italian market conditions, ChatGPT is able to question whether a plan might be successful, but it does not examine further or provide any suggestion to overcome the problem, especially in terms of financial oversight and operational adjustments.

Additionally, in both cases presented in *Image 1*, there's a discreet focus on stakeholders. It does not surprise since in the letters to shareholders it's a common practice for chairmen and presidents to reassure investors about their companies' ongoing and future effort to communicate effectively with shareholders and put in place practises to

ensure their commitment to meet all the stakeholders' needs and demands. Notably, ChatGPT gives a lot of relevance to employees' training and skills development and customers' satisfaction, dwelling also on enhancing diversity and inclusion. On one hand, it is evident that both responses shown in the image above strongly emphasize strategies and initiatives that directly impact employee productivity, customer satisfaction and that aligns with broader societal expectations for corporate responsibility. On the other hand, in very few cases ChatGPT perhaps comments on how the companies engage with other external stakeholders such as suppliers, partners, governments and investors.

Overall, the AI provides a very general description of the strengths and the potential vulnerabilities that emerge from the future business plans briefly described in the letters to shareholders. Even though, the analysis is not exhaustive, ChatGPT has proved to be sufficiently capable of deducing what are the elements that can produce a potential positive or negative outcome for the company. Undoubtedly, enhancing the discussion around financial specifics, broader stakeholders' concerns, and detailed risk management would have made the analysis more robust and insightful.

## **3.2 ASPECTS CHATGPT 4.0 SUGGESTS DETAILING FURTHER**

### **3.2.1 Quantitative analysis**

In the previous section, the discussion revolved around the question: which elements does ChatGPT 4.0 consider as a consequence of the request to analyse strengths and weaknesses of future business plans outlined in the letters to shareholders? The quantitative and qualitative analysis proved that the AI focuses mainly on sustainability and digitalization matters, lacking in precision as far as financial impacts on the business are concerned or risk management practices. Therefore, now it becomes particularly intriguing to see which elements and issues ChatGPT addresses if the task requested is to identify which topics are not addressed with detailed attention in the letter to shareholders for an overall presentation of the future plans to be implemented.

The question we should now focus on is the following: "Are there any aspects the company is not taking into consideration or examining further in presenting its future business plans?". Once again, *Table 3* shows the results obtained computing the ratio  $\frac{\# \text{ themed-specific words for each category}}{\text{Tot. \# words generated per answer}}$ . Before looking at the table, the first hypothesis that comes as a natural consequence of what has been observed in the previous paragraph, is that one might expect ChatGPT to pay less attention on a company's technological advancement or the efforts made to reach higher sustainability standards.

Contrary to these expectations, the themes of sustainability and digitalization still register the highest average occurrence ratios among all the responses. The average ratios are quite similar to those observed in *Table 2*. This result reasonably leads to think that ChatGPT prefers to put at the centre of attention the most discussed topics in the letter to shareholders rather than investigating more practical issues like those related to the financial impacts or risk management linked to the strategies a certain company is pursuing. Nonetheless, it is noteworthy that the AI seldom fails to mention one of the selected categories in this analysis, albeit with varying levels of precision.

Table 3 - ratio between themed-specific words and total amount of words generated per answer (second question)

|                                     | RISK   | FINANCIAL IMPLICATIONS | STAKEHOLDERS ENGAGEMENT | DIGITALIZATION AND TECHNOLOGY | SUSTAINABILITY |
|-------------------------------------|--------|------------------------|-------------------------|-------------------------------|----------------|
| A2A s.p.a                           | 0,0022 | 0,0086                 | 0,0108                  | 0,0237                        | 0,0151         |
| Abitare In s.p.a                    | 0,0046 | 0,0023                 | 0,0070                  | 0,0162                        | 0,0046         |
| ACEA s.p.a                          | 0,0140 | 0                      | 0,0168                  | 0,0084                        | 0,0084         |
| Aeroporto G. Marconi Bologna s.p.a. | 0,0086 | 0                      | 0,0202                  | 0,0144                        | 0,0173         |
| Alkemy s.p.a                        | 0,0085 | 0                      | 0,0028                  | 0,0169                        | 0,0141         |
| Amplifon s.p.a.                     | 0      | 0,0127                 | 0,0203                  | 0,0127                        | 0,0127         |
| Anima Holding s.p.a.                | 0,0145 | 0,0203                 | 0,0058                  | 0,0174                        | 0,0145         |
| Ariston Holding s.p.a.              | 0,0054 | 0                      | 0,0054                  | 0,0136                        | 0,0190         |
| Avio s.p.a.                         | 0,0078 | 0,0052                 | 0,0155                  | 0,0181                        | 0,0052         |
| Banca Generali s.p.a.               | 0,0052 | 0,0077                 | 0,0103                  | 0,0129                        | 0,0155         |
| Banca IFIS s.p.a.                   | 0,0051 | 0                      | 0,0127                  | 0,0304                        | 0,0101         |
| Bca profilo s.p.a.                  | 0,0093 | 0,0093                 | 0,0140                  | 0,0302                        | 0,0140         |
| Beghelli s.p.a.                     | 0,0068 | 0                      | 0,0114                  | 0,0137                        | 0,0114         |
| BFF bank s.p.a.                     | 0,0094 | 0,0063                 | 0,0031                  | 0,0126                        | 0,0189         |
| BPER banca s.p.a.                   | 0,0028 | 0,0113                 | 0,0169                  | 0,0225                        | 0,0056         |
| Brembo s.p.a.                       | 0,0119 | 0                      | 0,0059                  | 0,0386                        | 0,0089         |
| Brunello Cucinelli s.p.a.           | 0      | 0                      | 0,0089                  | 0,0148                        | 0,0148         |
| Carel Industries s.p.a.             | 0,0112 | 0,0112                 | 0,0028                  | 0,0337                        | 0,0028         |
| Cementir Holding s.p.a.             | 0,0160 | 0,0096                 | 0,0096                  | 0,0256                        | 0,0192         |
| Civitanavi Systems s.p.a.           | 0,0127 | 0                      | 0,0063                  | 0,0222                        | 0,0127         |
| ENI s.p.a.                          | 0,0064 | 0                      | 0,0032                  | 0,0225                        | 0,0129         |
| Ferrari s.p.a.                      | 0,0062 | 0                      | 0,0123                  | 0,0123                        | 0,0154         |
| Fincantieri s.p.a.                  | 0,0081 | 0,0027                 | 0,0027                  | 0,0243                        | 0,0108         |
| Leonardo s.p.a.                     | 0      | 0                      | 0,0156                  | 0,0286                        | 0,0130         |
| Moncler s.p.a.                      | 0,0118 | 0                      | 0,0147                  | 0,0088                        | 0,0088         |
| Mondadori s.p.a.                    | 0,0051 | 0,0025                 | 0,0152                  | 0,0329                        | 0,0177         |
| Newlat food s.p.a.                  | 0,0132 | 0                      | 0,0132                  | 0,0164                        | 0,0230         |
| Nexi s.p.a.                         | 0,0130 | 0                      | 0,0130                  | 0,0357                        | 0,0032         |
| Piaggio s.p.a.                      | 0,0085 | 0,0057                 | 0,0142                  | 0,0198                        | 0,0028         |
| Reply s.p.a.                        | 0,0028 | 0                      | 0,0168                  | 0,0532                        | 0,0168         |

Table 4 – Key statistical measures (second question)

|   | RISK   | FINANCIAL IMPLICATIONS | STAKEHOLDERS ENGAGEMENT | DIGITALIZATION AND TECHNOLOGY | SUSTAINABILITY |
|---|--------|------------------------|-------------------------|-------------------------------|----------------|
| MEAN ( $\mu$ )                            | 0,0077 | 0,0038                 | 0,0109                  | 0,0218                        | 0,0123         |
| MINIMUM (min)                             | 0      | 0                      | 0,0027                  | 0,0084                        | 0,0028         |
| MAXIMUM (MAX)                             | 0,0160 | 0,0203                 | 0,0203                  | 0,0532                        | 0,0230         |
| STANDARD DEVIATION ( $\sigma$ )           | 0,0045 | 0,0053                 | 0,0054                  | 0,0101                        | 0,0054         |
| COEFFICIENT OF VARIATION ( $\sigma/\mu$ ) | 0,5843 | 1,3754                 | 0,4905                  | 0,4660                        | 0,4355         |

Considering the category of “digitalization and technology”, the results for responses pertaining the letter to shareholders of companies like Nexi S.p.A. and Reply S.p.A. are predictable. Being respectively a PayTech company and a digital services society, ChatGPT puts a strong emphasis on aspects such as digital transformation and technological advancements within the company’s operations. Thus, justifying the particularly high values in their respective ratios. In fact, the average ratio for the digitalization theme stands at approximately 0,0218, while the average ratio for Nexi S.p.A. registers around 0,0357 and for Reply S.p.A. is 0,0532 circa (the maximum).

As mentioned before, sustainability appears to be another focal point in the responses, evidenced by an average ratio of approximately 0,0123. Specific companies such as Cementir Holding s.p.a. and Newlat Food s.p.a. present higher ratios, respectively of 0,0192 and 0,0230 (the maximum). By confronting the results obtained in *Table 1* (paragraph 3.1.1), it is possible to notice that sustainability issues have been already sufficiently addressed in the responses related to these two societies. More precisely, when commenting on the strengths and the weaknesses of the perspective plans to pursue, the AI focused on emphasizing as a strength the clear sustainability commitment of both companies. In fact, both Newlat Food and Cementir Holding have developed structured sustainability roadmaps that include investments in renewable resources and high-efficiency technologies to meet the requested decarbonization targets set for 2030 and 2050. On the other hand, with the prompt being to capture the missing elements to a comprehensive understanding of the future plans, OpenAi’s artificial intelligence reveals the necessity of a more detailed disclosure on financial and market risk management to benefit from a more long-term approach to sustainability and also to potentially attract sustainability-conscious investors and customers. In addition to this, the response highlights the necessity to provide further insights on how the sustainability practises that are going to be adopted will be monitored, which metrics are going to be used and what

are the necessary actions to integrate ESG efforts within all the levels of the organizations. Therefore, the persistent emphasis on this theme by ChatGPT is to be attributed to the fact that the AI actually points out the absence of properly explained strategies and impacts (as it will be shown later in the subsequent qualitative analysis).

A completely different scenario is observed according to the results obtained for the financial key words mentions. This is a potential area of concern, given that in 53,33% of the responses to this specific prompt, there is no mention at all of the selected key words for the category. This finding highlights a pronounced deficiency in ChatGPT's ability of extracting implicit financial effects and in foreseeing broader impacts on the financial health of the company. It is true that the analysis conducted through selected key words has some limitations, for instance, a certain topic can be addressed using different words, but the fact that in certain responses the most common words like "finance(s)" or "financial(s)" do not appear at all is certainly a red flag. Consequently, it is possible to deduct that, while ChatGPT can process and generate responses based on the content it is given, its ability to emphasize financial implications without providing it with explicit financial forecasts is limited.

Delving into the analysis of risk assessment as articulated in AI-generated evaluations of business plans, the emphasis on risk is, notably, lower than the ratios observed for digitalization & technology and sustainability, and only surpasses the ratio for financial implications, reflecting a similar result as the one observe with the data in *Table 2*. However, contrary to the findings in *Table 1*, the term "risk" does not uniformly appear across all responses generated by ChatGPT but it is present in 90% of them (27 out of 30). The average frequency with which the keyword "risk" is mentioned with respect to the total words generated per answer is about 0,0077. Generally, among the aspects that should be examined further and presented in the description of the future plans in the shareholder letter, the term "risk" is mentioned with respect to the following specific risks: supply chain risks, international expansion risks, macroeconomical and geopolitical risks, environmental risks (specifically, climate-related risks) and potential technological disruption risks. Furthermore, in 30% of the responses for the query under examination, ChatGPT highlights the importance to provide information related to a proper Risk Management framework, resulting in a comprehensive explanation of the strategies to adopt in order to avoid overlooking risks and likely incurring in negative outcomes, as well as the presentation of a well-arranged framework capable of turning risks into opportunities. Interestingly, within this 30% all the companies involved in the banking sector (Banca Generali s.p.a., Banca Ifis s.p.a., BCA Profilo s.p.a., Beghelli s.p.a., BFF Bank s.p.a., BPER banca s.p.a.) are included. This indicates that ChatGPT recognises the



imperative need to assess and manage all the risks to which banks are exposed as it is aware of the rapid development of financial markets and the internationalisation of financial flows. In fact, it is known that internationalisation and deregulation are playing a crucial role in increasing the risk of causing financial crises (Van Greuning & Bratanovic, 2020). Finally, ChatGPT only explicitly mentions once the urge to address the issue of financial risk management in its answers. In fact, the AI considers it only in Avio s.p.a.'s response, in which it clarifies that the high-value projects and investments in technology and in new markets the new company seeks to pursue, require a much more detailed risk management strategy to avoid a potential negative impact on profitability and cash flows.

Turning the attention to the "Stakeholders Engagement" section, the average of the observed ratios is approximately 0,0109, a figure that performs better than the categories pertaining financial impacts and risk management, yet it remains lower than the average ratios recorded for "Digitalization and Technology" and "Sustainability". According to *Table 4*, the minimum value is 0,0027 and it is related to the answer about Fincantieri s.p.a., while the maximum is 0,0203 related to the response for Amplifon S.p.A.'s future plans in the letter to shareholders. This latter case is going to be further analysed in the following section (paragraph 3.2.2). However, in Fincantieri's response the selected keywords for the category are related to the necessity to disclose a more detailed strategy that covers employee training, skills development and talent acquisition and retention, reflecting the increasing needs for specialized digitalization skills.

Furthermore, in the provided *Table 4*, the analysis examines the standard deviation and the coefficient of variation for each category (Risk, Financial Implications, etc..) computed with respect to the observations derived from *Table 3*. It is essential to stress the concept that the ratios presented in *Table 3* are very small values, therefore, a standard deviation that ranges approximately from 0,0045 to 0,0101 should not be disregarded. However, the variability indexes indicate that the dispersion within the data is relatively moderate across all categories. Notably, the category of "Financial Implications" exhibits the highest variability ( $1,3754 > 1$ ), which can be easily explained by the absence of financial keywords in over half of the responses. Conversely, the category of "Sustainability" shows the lowest variability, suggesting a more uniform mention of sustainability-related keywords across the responses.

### **3.2.2 Qualitative analysis**

As already highlighted, relying solely on word counts for specific keywords to ascertain whether specific aspects have been addressed presents limitations. To overcome the issue, it is useful to integrate the quantitative data with a qualitative review of the

responses. In the pursuit of this aim, two examples of responses pertaining to the second question, which probes into aspects insufficiently explored in the shareholder letters of Amplifon and Mondadori, have been revisited. *Image 2* presents the answers that ChatGPT generated concerning these “oversight areas”. The deliberate reselection of these two specific companies facilitates a direct comparison with the elements previously discussed in the first query related to “strengths and weaknesses”, thereby enabling a more comprehensive understanding of the AI's analytical capabilities and thematic focus.

As far as the structure of the generated responses is concerned, we can identify three distinct sections: an introductory part, a list of all the economic aspects that need to be examined further or considered from scratch, a brief conclusion. By examining *Image 2* it emerges that while the lexical choices in the introduction and conclusion are repetitive, the aspects that OpenAI's artificial intelligence addresses in analysing which elements are lacking a more nuanced examination exhibit significant variation, each response is tailored to the specific circumstances of the case in question.

From *Image 1* (paragraph 3.1.2) it's possible to acknowledge that the predominant themes in the future business plans outlined in the letters to shareholders and, consequently, the topics on which the AI develops major insights are related to international expansion and business growth initiatives, investments in digitalization and technology, introduction of new ESG practices, enhanced customer experience and employees training. Not only that, paragraph 3.1.2 underscores several omissions and imprecise observations in ChatGPT's responses. These deficiencies are going to be the starting point of this paragraph. The logical hypothesis that has to be made is that, by being asked to identify what should be considered further when presenting business plans, ChatGPT should be capable of addressing at least the limitations highlighted in the aforementioned paragraph.

Let's start with analysing the theme that has always proved to be the most accounted for in ChatGPT's responses: digitalization and technology. From the question related to “strengths and weaknesses” it is possible to notice how the AI generally considers as an advantage to make an effort to enhance the technological and digital performance of the company's processes, while it recognizes as a “weakness” the necessary huge investments and resource exploitation. From the second question (see *Image 2*), with respect to both the companies under examination, the AI advises to enhance cybersecurity practices and data privacy and protection. Normally, when a company expands its digital operations, it also increases the necessity to protect the data online. Cybersecurity and data privacy are never mentioned in the letters to shareholders, yet they constitute a very common theme throughout all the responses of ChatGPT, aligning once again with global trends.

Image 2 - ChatGPT's "elements to be considered or discussed further" responses for Amplifon S.p.A and Mondadori S.p.A.

|  |  |
|--|--|
| <p>While Amplifon's outlined strategies in the annual shareholder letter demonstrate a well-rounded approach to business growth, sustainability, and employee engagement, there are a few potential gaps or areas that could be further emphasized or addressed:</p> <ol style="list-style-type: none"> <li><b>Regulatory Compliance and Adaptation:</b> The letter does not explicitly address how the company plans to navigate the increasingly complex regulatory environment, particularly in the healthcare and retail sectors across different countries. As Amplifon expands globally, compliance with local laws and international regulations will become increasingly critical.</li> <li><b>Technological Security and Data Privacy:</b> With the introduction of new technologies like the Otopad audiometers and updates to their store formats, there is an inherent increase in the need for robust cybersecurity measures and data privacy protocols. The letter does not discuss how Amplifon plans to safeguard customer and company data against potential cyber threats.</li> <li><b>Supply Chain Resilience:</b> Given the global expansion and reliance on technological devices, a detailed strategy for ensuring supply chain resilience, especially in the face of global disruptions, is not highlighted. This is particularly important as geopolitical tensions and global pandemics have shown to severely impact supply chains.</li> <li><b>Detailed Financial Strategies for Sustainable Growth:</b> While financial growth figures and investments are mentioned, there is a lack of detailed financial strategy on how the company plans to sustain its profitability, manage debt, and handle potential economic downturns effectively.</li> <li><b>Customer Retention and Loyalty Programs:</b> As the company continues to expand its global presence and sales network, strategies to enhance customer retention and loyalty are not explicitly mentioned. In a competitive market, fostering customer loyalty through tailored programs or benefits could be crucial.</li> <li><b>Local Market Customization:</b> With expansion in diverse markets such as the United States, China, and Uruguay, there is no explicit mention of how Amplifon plans to customize its offerings and marketing strategies to fit the cultural and consumer behavior nuances of each specific market.</li> <li><b>Impact Measurement of Sustainability Initiatives:</b> While various sustainability initiatives are mentioned, the letter lacks detail on how the impact of these initiatives will be measured and reported. For initiatives to be truly effective, they need to have clear metrics for success and impact assessment.</li> </ol> <p>By addressing these areas, Amplifon can strengthen its business model and ensure a more comprehensive approach to dealing with future challenges and opportunities as it continues to expand and evolve in the dynamic global market.</p> | <p>While Mondadori Group's outlined plans in the shareholder letter provide a strong direction for consolidating its position in book publishing and advancing digital transformation, there are several areas that may require more attention or seem underemphasized in their strategic outlook:</p> <ol style="list-style-type: none"> <li><b>International Expansion:</b> The plans primarily focus on consolidating and expanding operations within Italy, with less emphasis on exploring opportunities in international markets. Diversifying geographically could mitigate risks associated with over-reliance on the Italian market and potentially tap into growth opportunities abroad.</li> <li><b>Technological Innovation Beyond Digital Media:</b> While digital transformation in media is highlighted, there is less emphasis on integrating new technologies in other areas of their business, such as advanced analytics, AI, or blockchain, which could transform operations or create new product offerings.</li> <li><b>Detailed Strategy for Digital Revenue Monetization:</b> While the shift towards digital media is acknowledged, the letter does not detail strategies for monetizing digital content effectively, especially in a market where consumers are often reluctant to pay for online content.</li> <li><b>Adaptation to Changing Consumer Behaviors:</b> The plans could better address how the company intends to adapt to rapidly changing consumer behaviors, especially younger demographics' preferences for consuming content digitally or through subscription models.</li> <li><b>Environmental Impact of Operations:</b> Although sustainability is mentioned, there is a lack of specific strategies for reducing the environmental impact of their physical products, particularly in print operations, and detailed plans for achieving any set environmental targets.</li> <li><b>Data Privacy and Security:</b> As digital operations expand, the importance of data privacy and cybersecurity grows. The plans should include strategies for enhancing data security, protecting customer privacy, and complying with increasingly stringent data protection regulations.</li> <li><b>Competitive Strategy Amid Industry Disruption:</b> The letter could elaborate more on how Mondadori plans to maintain its competitive edge amid rapid technological changes and competition from new entrants that could disrupt traditional publishing and retail models.</li> <li><b>Employee Skills Development:</b> While diversity and inclusion are highlighted, the plans might further elaborate on how the company intends to continuously develop the skills of its workforce to keep pace with technological advancements and shifting industry dynamics.</li> </ol> <p>By addressing these aspects, Mondadori Group can ensure a more comprehensive approach to its strategic planning, enhancing its resilience and adaptability in a fast-evolving market landscape. This will help the company not only to mitigate potential risks but also to capitalize on new opportunities more effectively.</p> |
|--|--|

In fact, Cybersecurity is mentioned 28 times among all the responses to question 2. Moreover, departing from an approach aimed at highlighting which elements of the plan to be implemented should be presented in greater detail or at least not ignored, GPT suggests a different practical action to follow. In fact, when examining the response concerning Mondadori s.p.a., it gives suggestions on the diversification of the business, noting that alongside the investments aimed at the expansion in the digital media sector, it would be beneficial to invest in, introduce and integrate more sophisticated tools (such as artificial intelligence and advanced analytics programs) to improve the efficiency and productivity of the operations.

The second theme exhibiting a notably high average keywords occurrence ratio is sustainability. While conducting the qualitative analysis of the sentences related to sustainability within the responses to the “strengths and weaknesses” query, it has emerged the need of a deeper exploration of how specific sustainability initiatives contribute to long-term business resilience, augment brand reputation, and the metrics that will be employed to effectively quantify sustainability progress. Bearing this in mind, *Image 2* reveals that ChatGPT actually points out the necessity of a more detailed description of the financial measures to support sustainability investments and projects, as well as their impact on the financial health of the company. Furthermore, it underscores the benefits that would derive from articulating more precisely the methods by which the company plans to report and evaluate the impact of its sustainability initiatives. Moreover, sustainability measures are frequently referenced in the announcements of future business plans, the limited exposition dedicated to them in the shareholders letter (few concise sentences) generally merely affirm the company’s commitment to minimizing its environmental impact, enhancing corporate governance practices, promoting diversity and inclusion among employees and being socially responsible. Despite that, ChatGPT 4.0 has proved to be capable of recognizing the absence of a detailed description of the environmental impact of the company’s future operations.

Considering the stakeholders’ engagement section, it is necessary to discern the Amplifon’s case from the Mondadori’s one. Recalling that Amplifon’s letter to shareholders presented the company’s ambition to continue to increase its global presence and its international network, ChatGPT’s response reasonably points out that the plan description does not explicitly mention whether or not a tailored and appropriate customer retention strategy or differentiated approaches to meet local expectations will be introduced. In the Mondadori’s case, the AI identifies the necessity to investigate further how the company plans to continuously enhance the skills of its workforce to adapt to constantly changing industry dynamics. More specifically, in the letter the chairman and the CEO have stated: “new competences and professional skills are crucial to our future” but the letter actually does not elaborate further the ways with which it intends to achieve this objective.

Finally, from the financial perspective, ChatGPT does not significantly emphasize the relevance of anticipating financial impacts and future performance in such a direct and qualitative document as the shareholder letter. It addresses the issue only by outlining the need for further examination of financial strategies such as debt management and profitability forecasting in relation to the consequences of implementing such ambitious

sustainability projects, in addition to providing information on how the company intends to monetize with the new projects it plans to undertake.

To sum up, when analysing what elements were not specifically addressed about future plans in the letters to shareholders, ChatGPT has partially considered almost all the elements that in paragraph 3.1.2 have been considered as neglected in the responses concerning the question related to the strengths and weaknesses of the plans, thus offering a more comprehensive perspective on what should have been considered and mentioned.

### **3.3 TESTING CHATGPT'S ABILITY TO COMMENT ON RISK MANAGEMENT**

#### **3.3.1 Quantitative analysis**

Nowadays the uncertainty that characterizes the global environment in which companies undertake their operation is a worrying factor. Global threats such as growing geopolitical tensions, environmental issues and high markets volatility raise the concern among all the economic operators and higher market expectations make it difficult to keep up with the strong pace of latest innovations and market trends. That's why a robust risk management framework is essential to approach all the possible risks that a company is obliged to deal with, in order to avoid waste and enhance productivity and performance (Hopkin, 2018; Widiанти et al., 2024).

To adequately deal with the risks companies face, the first necessary action is to meticulously recognize the primary risks each organization should address with particular effort. After a comprehensive identification of the risks, it is crucial to develop a proportioned and targeted risk management plan (which must meet all regulatory requirements) and effectively communicate it across all the levels of the organization. Obviously, risk management efforts should be aligned with organizational processes, decision-making processes and corporates' culture. Moreover, it is common to experience several changes in risk management practices due to the introduction of new tools and governance practices to manage all the risks in a more efficient way. There are more steps to consider for the implementation of a successful RM framework, among the most critical ones: effective risk measurement to understand the entity and develop proportionate solutions and, very importantly, risk monitoring (Hopkin, 2018). Due to the exposure to an incredible number of risks in an unstable landscape, effectively communicating risk management practises that support the future initiatives of a company would increase stakeholders' trust and attract a broader range of investors. Consequently, the latest question prompted to ChatGPT 4.0 is "Does the letter provide information related to risk

management for its future business plans? If not, what the company should consider in order to address the issue?''.

Table 5 - ratio between themed-specific words and total amount of words generated per answer (third question)

|                                     | RISK   | FINANCIAL IMPLICATIONS | STAKEHOLDERS ENGAGEMENT | DIGITALIZATION AND TECHNOLOGY | SUSTAINABILITY |
|-------------------------------------|--------|------------------------|-------------------------|-------------------------------|----------------|
| A2A s.p.a                           | 0,0371 | 0,0165                 | 0,0021                  | 0,0103                        | 0,0165         |
| Abitare In s.p.a                    | 0,0377 | 0,0063                 | 0,0126                  | 0,0084                        | 0,0188         |
| ACEA s.p.a                          | 0,0791 | 0,0128                 | 0,0230                  | 0                             | 0              |
| Aeroporto G. Marconi Bologna s.p.a. | 0,0584 | 0,0025                 | 0,0152                  | 0,0051                        | 0,0051         |
| Alkemy s.p.a                        | 0,0591 | 0,0051                 | 0,0154                  | 0,0077                        | 0              |
| Amplifon s.p.a.                     | 0,0449 | 0,0025                 | 0,0050                  | 0,0075                        | 0,0025         |
| Anima Holding s.p.a.                | 0,0466 | 0,0110                 | 0,0082                  | 0                             | 0,0055         |
| Ariston Holding s.p.a.              | 0,0501 | 0,0026                 | 0,0106                  | 0,0106                        | 0,0079         |
| Avio s.p.a.                         | 0,0450 | 0                      | 0,0118                  | 0,0190                        | 0,0047         |
| Banca Generali s.p.a.               | 0,0454 | 0,0068                 | 0,0159                  | 0,0136                        | 0,0045         |
| Banca IFIS s.p.a.                   | 0,0457 | 0,0208                 | 0,0125                  | 0,0166                        | 0,0208         |
| Bca profilo s.p.a.                  | 0,0471 | 0,0193                 | 0,0128                  | 0,0150                        | 0,0193         |
| Beghelli s.p.a.                     | 0,0373 | 0,0066                 | 0,0044                  | 0,0132                        | 0,0110         |
| BFF bank s.p.a.                     | 0,0489 | 0,0153                 | 0,0061                  | 0,0092                        | 0              |
| BPER banca s.p.a.                   | 0,0444 | 0,0099                 | 0,0025                  | 0,0222                        | 0,0173         |
| Brembo s.p.a.                       | 0,0437 | 0,0027                 | 0,0027                  | 0,0273                        | 0,0164         |
| Brunello Cucinelli s.p.a.           | 0,0418 | 0,0032                 | 0,0096                  | 0,0161                        | 0,0129         |
| Carel Industries s.p.a.             | 0,0474 | 0,0111                 | 0,0028                  | 0,0167                        | 0,0195         |
| Cementir Holding s.p.a.             | 0,0381 | 0,0069                 | 0                       | 0,0138                        | 0,0208         |
| Civitanavi Systems s.p.a.           | 0,0336 | 0,0067                 | 0                       | 0,0168                        | 0,0134         |
| ENI s.p.a.                          | 0,0064 | 0                      | 0,0032                  | 0,0225                        | 0,0129         |
| Ferrari s.p.a.                      | 0,0473 | 0                      | 0,0068                  | 0,0169                        | 0,0236         |
| Fincantieri s.p.a.                  | 0,0334 | 0,0103                 | 0,0077                  | 0,0180                        | 0,0206         |
| Leonardo s.p.a.                     | 0,0505 | 0,0080                 | 0,0053                  | 0,0239                        | 0,0186         |
| Moncler s.p.a.                      | 0,0213 | 0                      | 0,0177                  | 0,0284                        | 0,0248         |
| Mondadori s.p.a.                    | 0,0443 | 0,0044                 | 0,0089                  | 0,0155                        | 0,0067         |
| Newlat food s.p.a.                  | 0,0453 | 0,0070                 | 0,0105                  | 0,0105                        | 0,0139         |
| Nexi s.p.a.                         | 0,0288 | 0,0072                 | 0,0072                  | 0,0360                        | 0              |
| Piaggio s.p.a.                      | 0,0275 | 0,0055                 | 0,0110                  | 0,0357                        | 0,0027         |
| Reply s.p.a.                        | 0,0444 | 0,0089                 | 0,0030                  | 0,0414                        | 0              |

Table 6 – Key statistical measures (third question)

|   | RISK   | FINANCIAL IMPLICATIONS | STAKEHOLDERS ENGAGEMENT | DIGITALIZATION AND TECHNOLOGY | SUSTAINABILITY |
|---|--------|------------------------|-------------------------|-------------------------------|----------------|
| MEAN ( $\mu$ )                            | 0,0427 | 0,0073                 | 0,0085                  | 0,0166                        | 0,0114         |
| MINIMUM (min)                             | 0,0064 | 0                      | 0                       | 0                             | 0              |
| MAXIMUM (MAX)                             | 0,0791 | 0,0208                 | 0,0230                  | 0,0414                        | 0,0248         |
| STANDARD DEVIATION ( $\sigma$ )           | 0,0126 | 0,0055                 | 0,0056                  | 0,0099                        | 0,0082         |
| COEFFICIENT OF VARIATION ( $\sigma/\mu$ ) | 0,2948 | 0,7546                 | 0,6633                  | 0,5979                        | 0,7185         |

The results of the ratio between the themed-specific words and the total amount of words generated per answer to the “risk management” question are portrayed in *Table 5*.

Comparing the results obtained in *Table 1* and *Table 3*, *Table 5* does not differ much in terms of the focus given to the examined topics across the different responses by ChatGPT. Obviously, the biggest difference is related to a pronounced use of the term “risk” given the specificity of the prompt (avg ~ 0,0427). Besides this, the second more pronounced focus (as detected from the repetency of the selected keywords) is again on digitalization and technology (avg ~ 0,0166), followed in order by sustainability issues (avg ~ 0,0114), stakeholders engagement matters (avg ~ 0,0085) and finally financial implications (avg ~ 0,0073).

By counting the times the word “risk” has been mentioned, the intent is to understand how many and which types of risks the AI focuses on. For instance, the responses for ACEA S.p.A. and Leonardo S.p.A. show the highest ratios (0,0791 and 0,0505 respectively), specifically in those cases the term “risk” has been used to serve two different scopes. In the first case (ACEA s.p.a.), ChatGPT 4.0 detected that a few brief observations about cost optimization, financial leverage equilibrium and procurement tactics have already been made in the shareholders letter for future plans. Therefore, the AI does not concentrate on identifying risks to monitor and manage, but it points out all the actions to undertake for a comprehensive management of the mentioned risks.

In the response related to Leonardo s.p.a., the AI detected the lack of explicit information about risk management strategies. As a consequence, considering the defence and aerospace sector in which the company operates, it identifies several risks to consider and towards which some specific actions are required: geopolitical risks, supply chain risks, cybersecurity risks, technological and innovation risks, regulatory and compliance risks, environmental and sustainability risks, interest rate changes and financial risks.

Finance-related keywords still perform a lower average frequency (0,0073). The selected financial keywords are mentioned in 86,67% of the cases observed (meaning that only 4/30 observations are equal to 0). The frequency with which they appear in the responses is way higher than the one portrayed in *Table 3* (paragraph 3.2.1), but identical to the one presented in *Table 1* (3.1.1). It does not surprise so far that, since financial aspects of risk management are frequently not explicitly detailed in the letters, the AI struggles more with extracting financial implications from the provided letters. Financial issues in risk management are generally addressed by ChatGPT focusing on risks related to price fluctuations and market volatility, interest and exchange rate sensitivity and it

often suggests including information related to financial forecasts, debt management and budgeting when describing future business plans.

With an average occurrence ratio of 0.0166, there seems to be again a relatively higher mention of technology-related keywords. The selected keywords for the “digitalization and technology” category are omitted only in 2/30 responses (6,67% of the observations). Across all the responses analyzed, there are cases in which the AI considers digitalization and technology instrumental in enhancing risk monitoring and measurement activities, while in other cases it addresses the challenges posed by rapid technological advancements and the consequent competitive pressures. For instance, the maximum observed value for the category is 0,0414 and it corresponds to the analysis of Reply S.p.A., a company in which the focus on digitalization is the core of its own business. In this response, ChatGPT notes the absence of explicitly mentioned specific risk management strategies for future business plans in the letter to shareholders. Therefore, the AI suggests that Reply should consider to adequately address potential issues such as technological risks inherent to rapid changes in cutting-edge technologies, the complexities of a continuously evolving regulatory environment which complicates the compliance with data protection laws and similar regulations, and reputation risks associated with possible misuses or biases in AI applications to be mitigated through an ethical use of AI implementing ethical guidelines and transparent AI governance.

Analysing the column related to the sustainability-related keywords count ratio, it is shown that although the average ratio is higher than the ones for the “stakeholders engagement” and “financial implications” categories, the selected sustainability keywords have not been mentioned at all in about 16,67% of the cases, with the remaining observations being: 53,33% above the average ratio (0,0114) and 30% ranging from around 0,0025 and 0,0110. The absence of the sustainability-related keywords in five responses justifies the fact that the average “sustainability ratio” in *Table 6* is lower than the ones shown in *Table 2* and in *Table 4*.

Finally, the attention must also be directed towards the “Stakeholders Engagement” column. *Table 6* displays that the relative average ratio is only higher than the average ratio for the financial keywords. The number of observations equal to zero is 2/30. The maximum ratio is 0,0230, reached in ChatGPT’s response to the risk management question for ACEA S.p.A., in which the artificial intelligence focused mainly on Stakeholders Communication. In fact, ChatGPT’s answer elucidates the necessity to enhance trust and confidence in the company's ability to manage risks effectively across all the various groups of stakeholders (including shareholders, regulators, customers, employees, and suppliers).



Overall, in its responses, OpenAI's intelligence quite successfully assesses both internal and external risks, such as financial, operational, regulatory, market and geopolitical risks, and prioritize those whose effects are likely to be the most impactful on the company's operations and finances; suggests to implement internal controls and cybersecurity measures; considers the importance of introducing hedging strategies to minimize financial risks; examines the benefits of diversifying revenue streams; advices on introducing key risk indicators and enhancing reporting structure to facilitate transparency and accountability; acknowledges the cruciality of embedding risk management into decision-making processes, resource allocation, and performance management frameworks.

Moreover, *Table 6* collects the results obtained by computing the standard deviation and the coefficient of variation on the observations from *Table 5* for each thematical category. The average deviation of the set of values from the mean can be considered quite meaningful, taking into account the fact that the ratios from *Table 5* are exceptionally small. Despite this, to evaluate whether the level of dispersion across the data is particularly high, it is necessary to have a look at a variability index. The coefficients of variation portrayed in the table above reveal that, also in this analysis, the dispersion across all categories is relatively contained. The 'Financial Implications' is still the category that shows the highest level of variability. On the other hand, not surprisingly, this time the "Risk" category displays the lowest variability, indicating a more consistent mention of the term "risk" across the dataset (in accordance with the specific query about risk management).

### **3.3.2 Qualitative analysis**

In order to accomplish the qualitative analysis, for the third and last time, the examples from ChatGPT's responses to the third question related to Amplifon s.p.a. and Mondadori s.p.a. are portrayed in *Image 3*.

Firstly, it is necessary to proceed with an analysis of the structure of the responses. Like the responses to the first and second questions, also in this case the structure is pretty similar. It starts with a brief introduction of the elements related to risk management practises the company intends to incorporate in its strategies, then risks identification and assessment, it continues with Risk Mitigation Strategies, Crisis Management Plans and then addresses specific issues tailored to the company's situation, to conclude with a small paragraph dedicated to stakeholders' engagement and a brief final consideration.

Recalling what has been said in paragraph 3.3.1, this structure has been shared in responses similar to the mentioned ACEA's case, while there are a few more cases in which

ChatGPT names the paragraphs of the generated responses after the specific risks the company lacks to consider (like the already mentioned Leonardo S.p.A.'s case).

Image 3 - ChatGPT's "risk management" responses for Amplifon S.p.A and Mondadori S.p.A.

|   |  |
|---|--|
| <p>🌀 The letter to shareholders from Amplifon does highlight some external challenges, such as a "softer than expected European market" and a "global macroeconomic and geopolitical environment characterized by uncertainty and volatility." However, it does not explicitly detail specific risk management strategies or frameworks that the company intends to implement to navigate these challenges effectively as part of its future business plans.</p> <p>To address this gap, Amplifon could consider implementing several risk management strategies to ensure robust handling of potential risks:</p> <p><b>COMPREHENSIVE RISK MANAGEMENT FRAMEWORK</b></p> <p><b>1. Risk Identification and Assessment:</b></p> <ul style="list-style-type: none"> <li>- <b>Market Risk:</b> Analyze market trends and economic indicators to anticipate shifts that might affect the business.</li> <li>- <b>Geopolitical Risk:</b> Keep abreast of international developments that could impact operations, particularly in regions where Amplifon has significant investments.</li> <li>- <b>Regulatory Risk:</b> Monitor changes in healthcare and retail regulations across different countries to ensure compliance and prepare for adjustments in operations.</li> </ul> <p><b>2. Risk Mitigation Strategies:</b></p> <ul style="list-style-type: none"> <li>- <b>Diversification:</b> Continue to diversify the market presence to spread risk across different regions and reduce dependence on any single market.</li> <li>- <b>Technological Integration:</b> Enhance cybersecurity measures and data protection protocols to safeguard against technological risks.</li> <li>- <b>Supply Chain Management:</b> Develop strategies to manage and mitigate risks from supply chain disruptions, including alternative sourcing strategies and local inventory management.</li> </ul> <p><b>3. Crisis Management Plans:</b></p> <ul style="list-style-type: none"> <li>- Establish clear protocols and action plans for responding to different types of crises, whether they be financial, technological, or health-related (like a pandemic).</li> </ul> <p><b>4. Continuous Monitoring:</b></p> <ul style="list-style-type: none"> <li>- Implement systems for the ongoing monitoring of identified risks, ensuring that the company can respond proactively to changes rather than reactively.</li> </ul> <p><b>INTEGRATION WITH BUSINESS STRATEGY</b></p> <ul style="list-style-type: none"> <li>- <b>Align Risk Management with Business Objectives:</b> Ensure that risk management strategies are not only reactive but also integrated into the strategic planning process. This approach should support the company's long-term objectives and help in maintaining steady growth despite external shocks.</li> </ul> <p><b>STAKEHOLDER COMMUNICATION</b></p> <ul style="list-style-type: none"> <li>- <b>Transparent Reporting:</b> Enhance communication about risk management practices with stakeholders through regular reporting in annual reports, shareholder meetings, and other communications. This transparency helps build trust and provides reassurance about the company's stability and foresight.</li> </ul> <p>By focusing on these areas, Amplifon can enhance its resilience against potential risks and ensure that its ambitious growth and innovation plans are supported by a robust risk management framework. This will not only protect the company's assets and reputation but also contribute to its sustainable growth and stability in the competitive global market.</p> | <p>🌀 The letter to shareholders from Mondadori Group's 2023 annual report outlines various strategic initiatives and achievements but does not explicitly discuss detailed risk management strategies for its future business plans. Although the company acknowledges the macroeconomic instability and challenges, there is no comprehensive information on how they plan to manage risks associated with their strategic pursuits, market conditions, or operational execution.</p> <p>To strengthen their strategic planning and ensure sustainable growth, Mondadori Group should consider the following approaches to risk management:</p> <p><b>COMPREHENSIVE RISK MANAGEMENT STRATEGIES</b></p> <p><b>1. Risk Identification and Prioritization:</b></p> <ul style="list-style-type: none"> <li>- <b>Market and Financial Risks:</b> Regularly assess risks associated with market volatility, economic downturns, and financial disruptions, especially given the unstable macroeconomic environment.</li> <li>- <b>Operational Risks:</b> Identify risks related to the integration of new acquisitions, supply chain disruptions, and technological advancements.</li> </ul> <p><b>2. Risk Mitigation Plans:</b></p> <ul style="list-style-type: none"> <li>- <b>Diversification:</b> Continue to diversify revenue streams not only within digital transformation in the media sector but also through geographic and product diversification to mitigate risks from market concentration.</li> <li>- <b>Technology Integration:</b> Invest in advanced technology for better risk monitoring, particularly in areas like cybersecurity, data privacy, and digital content management.</li> <li>- <b>Strategic Acquisitions and Partnerships:</b> Carefully evaluate and integrate acquisitions to ensure they align with the company's core strengths and market goals, reducing integration risks.</li> </ul> <p><b>3. Crisis Management and Business Continuity Planning:</b></p> <ul style="list-style-type: none"> <li>- Develop and regularly update crisis management and business continuity plans to respond quickly to economic, technological, and supply chain disruptions.</li> </ul> <p><b>4. Regular Monitoring and Reporting:</b></p> <ul style="list-style-type: none"> <li>- Implement a robust monitoring system to track risk indicators and adjust strategies promptly. This includes setting up a dedicated risk management team if needed.</li> <li>- Enhance transparency by regularly reporting on risk management practices and outcomes to stakeholders through annual reports and shareholder meetings.</li> </ul> <p><b>REGULATORY COMPLIANCE AND GOVERNANCE</b></p> <ul style="list-style-type: none"> <li>- <b>Enhance Governance Structures:</b> Strengthen governance mechanisms to oversee risk management practices, ensuring they are embedded in all strategic decisions and operational processes.</li> <li>- <b>Compliance with Regulatory Changes:</b> Stay updated with and adapt to regulatory changes, particularly those affecting the publishing and digital media sectors.</li> </ul> <p><b>EMPLOYEE TRAINING AND ENGAGEMENT</b></p> <ul style="list-style-type: none"> <li>- <b>Skill Development:</b> Enhance employee training programs focused on risk awareness and management, particularly for teams in strategic roles and operations.</li> </ul> <p><b>STAKEHOLDER ENGAGEMENT</b></p> <ul style="list-style-type: none"> <li>- <b>Engage with Stakeholders:</b> Regularly engage with all stakeholders, including employees, customers, and investors, to gain insights into potential risks and expectations, fostering a culture of transparency and accountability.</li> </ul> <p>By incorporating these risk management strategies into its overall business planning, Mondadori Group can better prepare for potential challenges and ensure that its strategic goals are achieved in a sustainable and resilient manner. This approach will not only protect the company's assets and reputation but also contribute to its long-term success and stability in the competitive global market.</p> |
|---|--|

In these two examples, it is possible to notice that the AI recognizes that a partial mention of the challenges the companies are going to face is presented in the letter to shareholders. In fact, from the Amplifon's example, we can see that ChatGPT explicitly cites the words used by the chairman of the company in communicating future perspectives to the shareholders.

As far as the risk identification is concerned, we can notice that the types of risks on which ChatGPT focuses its attention considering both answers are related to market and financial risks, operational risks, geopolitical and regulatory risks.

The "financial category" is therefore addressed when the AI suggests considering economic indicators to track down economic shifts that could affect the companies' financial health, thus, indirectly, leading to assume that more precise and analytical information related to external market and economic conditions would be appropriate when discussing future business plans. Anyway, throughout the entire text, some additional information could have been considered, such as hints on how the companies plan to manage debt, optimize costs and invest their assets in implementing the mentioned future plans.

As far as the "digitalization and technology" category is concerned, with the question related to strengths and weaknesses and the one related to the additional elements a letter to shareholders should contain for a more comprehensive communication, the AI detected the intentions of the companies to enhance their technological and digital approach. In answering the query related to risks and risk management, a focus on the technological and digital approach to be communicated is given when the AI states that in order to protect sensible data, companies should consider cybersecurity and digital content management a priority.

Moreover, both texts also focus on stakeholders' engagement. Once again, it focuses on communicating with employees, customers and investors with the goal of obtaining further insights on risks and expectations, it also highlights the importance of a transparent communication to reassure stakeholders about the company stability and its resilience capabilities. However, with respect to this third question, the AI addresses also the need to properly engage with suppliers to avoid supply chain disruptions.

In conclusion, the revelation that we can extrapolate from the way with which ChatGPT deals with the specific prompt in exam is that it generally refers to the most common frameworks for Risk Management (such as ISO 31000) to articulate comments about the strategies and the actions to undertake, but instead of focusing much on the risks mentioned by the company, it makes an effort to trace back all the risks that similar

companies have to face. For instance, the letters to shareholders of Amplifon and Mondadori never mention the issue of enhancing data protection, yet ChatGPT always highlights the need to refer to proper cybersecurity technologies.

Additionally, even if the answers concentrate on the most common practices used in risk management, the insights we gain from them can serve as a base to enhance corporate communication even in small documents such as shareholder letters to provide investors with a faster and more direct way to learn about the companies' resilience and adaptation strategies towards risks when implementing future business plans.

## CONCLUSION

To conclude, the study's methodology consisted of an alternative approach that integrates both a quantitative keyword analysis and a qualitative assessment to evaluate the effectiveness of ChatGPT's responses in addressing various critical business themes such as risk management, financial implications, stakeholder engagement, digitalization and technology, and sustainability practices. This research paper investigates the capabilities of ChatGPT 4.0 in analysing shareholder letters of companies listed on the EuroNext Milan market with respect to their future business plans and associated risks.

Throughout all the responses to the three different questions, the findings revealed that ChatGPT has a pronounced ability to focus on contemporary issues like digitalization and sustainability. This focus underscores the AI's capacity to detect and emphasize areas that are increasingly pivotal in today's business landscape. However, while these themes received considerable attention, the AI showed varying degrees of attention towards other critical areas such as financial implications and risk management, which are essential for a comprehensive business analysis.

At this point, it can be useful to recap all the primary observations and results of this research. First of all, it has been highlighted that the “Digitalization and Technology” category has always had the highest mean ratio, ranging from 0,0155 to 0,0218, except for the results associated to the third question in which obviously the keyword “risk” was predominantly mentioned according to the specific request. In this case, not only ChatGPT has proved to be capable of recognizing the efforts made by the company towards a more digital and technological approach to improve productivity and keep up with the latest advancements in the field shared by many other competitors, but also it has provided suggestions and highlighted the risks associated with the necessary investments and technological disruptions.

Similarly, sustainability has been another dominant theme that ChatGPT has vigorously addressed. ChatGPT has been able to discern companies' commitments to sustainable practices, which is particularly relevant given the increasing importance of ESG (Environmental, Social, Governance) factors in business valuations and investor decisions. Moreover, in several responses the AI has also addressed the issue of integrating ESG practises into business strategies and establishing adequate KPI for non-financial reporting.

As far as the category of “Risk Management” is concerned, the analysis conducted has demonstrated that while ChatGPT consistently recognised various types of risks the companies might have to deal with, its depth in evaluating risk management strategies was limited. Thus, although it could identify the presence of risks, the AI often lacked the ability

to delve into specifics about risk mitigation strategies or the comprehensive impact of these risks on the company's future, specially from a financial standpoint.

As stated multiple times, ChatGPT's engagement with financial aspects has been found to be less thorough compared to other themes. There has been a noticeable gap in its ability to analyse and interpret deeper financial strategies or implications of business plans thoroughly.

Finally, the AI showed variable attention to how companies plan to communicate with stakeholders and satisfy their needs. Although ChatGPT has proved to be able to identify the main general statements about the future actions the companies plan to undertake with respect to stakeholder engagement, a detailed analysis regarding the impact of business decisions on different stakeholder groups was often superficial. In fact, ChatGPT 4.0 has developed its responses around the implications for stakeholders such as employees, investors and customers, while neglecting to investigate further how future plans will impact other categories of stakeholders, such as suppliers.

Another aspect worth mentioning is that the dispersion across all categories is relatively contained for all the three cases analysed. The low dispersion indexes indicate that ChatGPT consistently addresses same topics with a similar frequency. Despite its incontestable ability to tailor the output responses to the specificities of the subject of the query, these results demonstrate that **there are certain themes that ChatGPT systematically considers more than others across different contexts**. Another recurrent aspect is that, overall, the category of "Financial Implications" often exhibits the highest variability, a trait which can be easily explained by the frequent omissions of financial keywords in ChatGPT's responses.

As highlighted in chapter 1, ChatGPT relies on artificial neural networks built up on multiple layers of transformers based on a self-attention mechanism that studies the relationships between words and the relative centrality of a word in a text to logically extrapolate data from a textual content and generate an appropriate output (Fui-Hoon Nah et al., 2023; Kim et al., 2023; Vaswani et al., 2017). Moreover, as pointed out in paragraph 1.3.1, all financial reporting documents (including letters to shareholders) are extremely generic in disclosing future business plans due to the inherent risks already mentioned. Therefore, companies avoid displaying financial forecasts associated with future projects or other forms of sensible data (Lakshan et al., 2021). Thus, since letters to shareholders put much more emphasis on disclosing details about future plans with respect to the thematic areas of digitalization and sustainability rather than financial implications and risk management, ChatGPT is likely to follow the same direction. This partially explains the

reason why the AI did not focus extensively on focal areas such as financial implications, stakeholders' engagement and risk management.

Another factor that impacted on these results is the inability of ChatGPT to extrapolate data from different sources attaining events occurred in 2024. Although digitalization and sustainability are common concerns among different companies, financial implications are closely tied to the company's specific circumstances and performance. Consequently, if the GPT system is not trained with additional data related to financial prospects and investments, its outcome will be rather generic and thus limited. Nevertheless, adopting an optimistic perspective in light of the achievements already reached by ChatGPT, it is not impossible that, in the near future, generative AI systems will be trained to be capable of making financial forecasts independently.

Overall, this research paper indicates that ChatGPT has proved to be an amazing support in the analysis of letters to shareholders because it can identify strategic emphases and gaps in disclosure within few seconds. However, over-reliance should not be considered an option at all since ChatGPT's responses can present biases and might be imprecise or lack in providing essential pieces of information. That is why other papers have raised concern about the fact that ChatGPT should not be used as a replacement for human work, but as a valuable assistant (Fui-Hoon Nah, 2023).

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