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## Integration of Sustainability Reporting into Enterprise Risk Management: A Scoping Review

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Tomasz Mankowski<sup>1</sup>

**Abstract:**

**Purpose:** The aim of the article is to assess the current state of knowledge and identify expected directions for future research on the integration of sustainability reporting in ERM.

**Design/Methodology/Approach:** This paper explores the challenges and opportunities associated with integrating SR into ERM, particularly in light of stringent global regulations like the European Sustainability Reporting Standards (ESRS). Through a Scoping Review, using the VOSviewer tool for bibliometric analysis, this study maps the existing literature and identifies key research trends and gaps in the intersection of SR and ERM.

**Findings:** The findings highlight the limited integration of sustainability concerns into traditional ERM frameworks and emphasize the need for a unified approach to manage both business and ESG risks. Key challenges identified include data complexity, regulatory uncertainty, and expertise gaps, all of which hinder effective integration. The paper concludes that developing integrated ERM methodologies that encompass both traditional business risks and ESG-related risks is essential for organizations to enhance decision-making, comply with evolving regulations, and drive long-term value creation.

**Practical implications:** Future research should focus on proposing practical solutions and best practices to support the seamless integration of SR into ERM.

**Originality value:** Enterprise Risk Management (ERM) has become a critical component of modern business strategy, particularly in the context of sustainability. As organizations face an increasing array of risks, including environmental, social, and governance (ESG) factors, the integration of sustainability reporting (SR) into ERM is gaining importance.

**Keywords:** Sustainability Reporting, European Sustainability Reporting Standards, Enterprise Risk Management.

**JEL codes:** G32, D81.

**Paper type:** Research article.

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<sup>1</sup>University of Szczecin, Poland, e-mail: [tomasz.mankowski@usz.edu.pl](mailto:tomasz.mankowski@usz.edu.pl);

## 1. Introduction

Enterprise Risk Management (ERM) is increasingly popular among companies around the world, especially as they face a growing array of risks that can affect their long-term success (Izah and Ahmad Rizal, 2011; Eryilmaz, 2018). Over the past few decades, ERM has evolved from a niche practice to a core component of business strategy for organizations of all sizes and sectors. As Shad *et al.* (2019) point out, today ERM plays a significant role in the sustainable development of the organization through the identification, measurement, and management of risk, including risks related to sustainability.

A new challenge for companies is integrating sustainability reporting (SR) into ERM. Integrating SR into ERM is becoming particularly important given the increasingly stringent global and European Union climate policy and today's rapidly evolving business landscape.

By integrating SR into ERM, businesses can better identify, assess, and manage these emerging risks. These risks are often long-term and can have severe consequences if not adequately addressed. The integration of SR with ERM ensures that organizations are not only compliant with regulatory and compliance requirements but are also prepared for changes in the regulatory landscape.

Integrating SR into ERM allows businesses to incorporate environmental, social, and governance factors into their risk models, ensuring more comprehensive and risk-adjusted decision-making (Saeidi *et al.*, 2019). ERM, when aligned with SR, helps to proactively manage the reputational risks, and brand value, and safeguard the organization's reputation (Linguanti, 2021).

By integrating SR into ERM, organizations can provide clear, data-driven insights into how they are addressing these concerns, thereby enhancing investor confidence and stakeholder trust (Lin *et al.*, 2019; Naser Albastaki and Shaukat, 2023). The businesses can better plan for long-term risks and opportunities, driving resilience, innovation, and sustainable growth (long-term value creation). Integrating SR into ERM also ensures that all risks, including ESG (environmental, social, and governance) factors, are considered in a unified framework, leading to more robust overall risk management. It also helps businesses build resilience by developing strategies to mitigate risks and capitalize on emerging opportunities related to sustainability (Fasan, 2013).

Moreover, companies that effectively integrate sustainability into their ERM processes and reporting demonstrate a commitment to these values, which can help attract and retain top talent, especially among younger generations (Chillakuri and Mahanandia, 2018). In addition, sustainability reporting can highlight inefficiencies in resource use, waste, and energy consumption. Integrating these findings into ERM can lead to operational improvements and cost savings, such as reduced energy

consumption, better waste management, and optimized supply chains (Escoto, Gebrehewot and Morris, 2022). This can positively affect the bottom line while also contributing to broader environmental goals.

In the European Union (UE) market, a major challenge for businesses is the implementation of the European Sustainability Reporting Standards (ESRS). The ESRS represents a comprehensive framework for sustainability reporting aimed at increasing transparency and standardization in environmental, social, and governance (ESG) performance (Hummel and Jobst, 2024).

As part of the European Union's Directive on corporate sustainability reporting (CSRD), (European Commission, 2023), the ESRS requires companies to disclose detailed ESG data, which poses several challenges for integrating sustainability into ERM (Fornasari and Traversi, 2024). These challenges are connected with the complexity and volume of data, data quality and consistency, alignment with existing risk frameworks, internal capacity and expertise, evolving regulations and standards, materiality assessment, and risk quantification, integration of non-financial and financial risk management, stakeholder expectations, supply chain complexity and risk of greenwashing.

The identified challenges of integrating SR with ERM are new and require the development of best managerial practices that take into account the experiences of various organizations in different sectors. The aim of the article is to assess the current state of knowledge and identify expected directions for future research on the integration of sustainability reporting in ERM. The study used elements of the systematic review method (SRL) - the Scoping Review and the VOSviewer IT tool. The remainder of this paper is organized as follows: section 2 presents the research methodology, section 3 shows the results of the scoping review, and section 4 provides discussion and concludes the study.

## **2. Research Methodology**

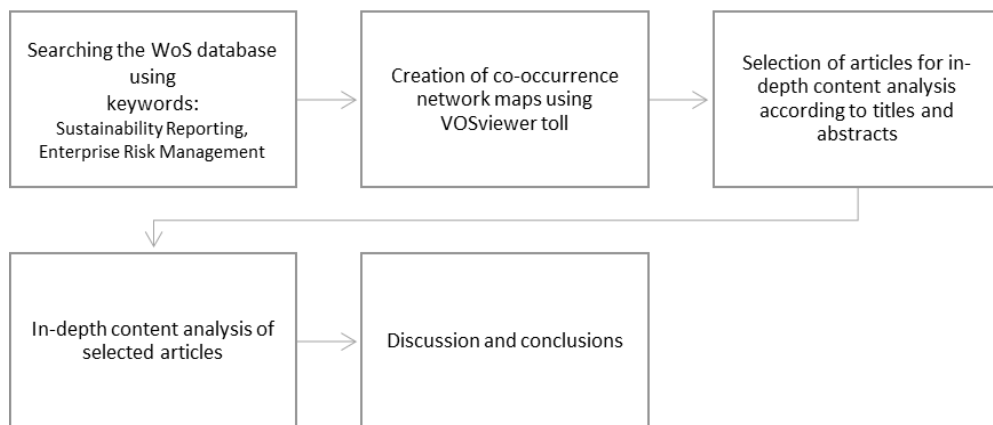
The SRL method (Munn *et al.*, 2018) employed the Scoping Review (SR) technic for selecting and aggregating knowledge through the process of mapping and structuring information provided by the literature review. In particular in terms of the main concepts, theories, types, and sources of knowledge (Cooper *et al.*, 2021). The SR is a useful method for studying literature, especially when the goal is to map out the existing research on a broad topic, identify key concepts, gaps, and evidence, and clarify the scope and nature of the available literature (Colquhoun *et al.*, 2014; Tricco *et al.*, 2016; Pettersen-Sobczyk and Mańkowska, 2024).

The scoping literature review process used the VOSviewer IT tool (version VOSviewer 1.6.20). The VOSviewer is a popular software tool used for visualizing and analyzing bibliometric networks (van Eck and Waltman, 2010; Bukar *et al.*, 2023). Using VOSviewer, keyword co-occurrence analysis was carried out to

visualize the main research areas and their interrelationships on the integration of SR into ERM. The co-occurrence of keywords can signal the existence of research sub-areas or identify premises that guide the further development of a research area.

The research process was conducted in two stages: literature mapping with VOSviewer tool and analysis of the mapped content of selected articles linking SR and ERM. The co-occurrence analysis used source data from the WoS (Web of Science) database in RIS (Research Information Systems) format. The keywords came from the bibliographic descriptions of the publications. Figure 1 shows the stages of the research process.

*Figure 1. The stages of the research process.*



*Source: Own study.*

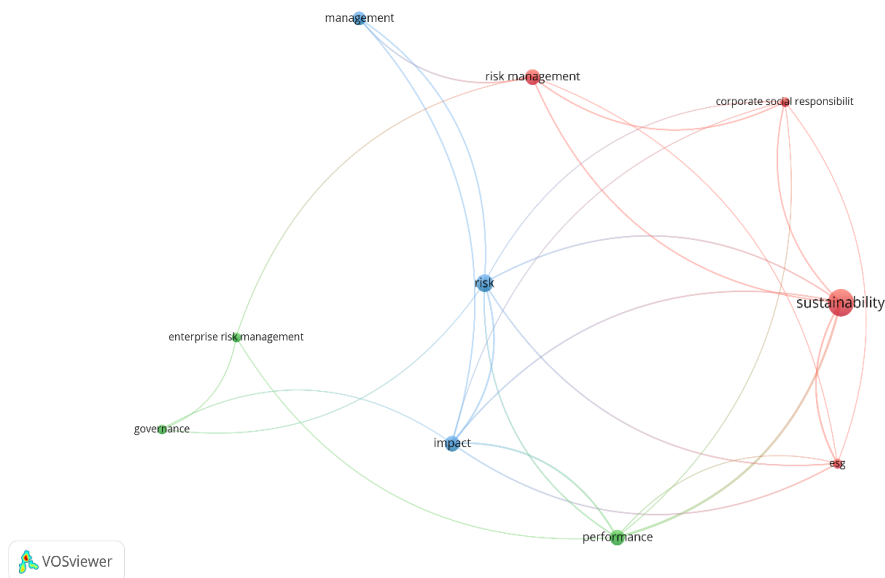
For the query ‘sustainability reporting’ in the WoS database (access 20.10.2024), the search selected 40,041 items. Refining the search by the keyword Enterprise Risk Management resulted in 49 items. Next, an analysis of the mapped content of selected 49 articles linking SR and ERM was prepared (co-occurrences network map). Simultaneously, based on the content analysis of titles and abstracts of the selected 49 literature, 6 articles directly corresponding to the issues of SR integration in ERM, were selected for in-depth review. The conclusions from the in-depth review of the content of these articles were presented in the discussion

### 3. Results

The analysis of the mapped content of selected 49 articles linking SR and ERM was prepared using VOSviewer tool. The minimum number of keywords was set at level 5 suggested by VOSviewer. Of the 378 keywords, 10 meet the threshold. For each of

the 10 keywords, the total strength of the co-occurrence links with other keywords was calculated. The keywords with the greatest total link strength (10) were grouped into 3 clusters (Figure 2).

**Figure 2.** Co-occurrences network map of keywords ‘sustainability reporting’ and ‘Enterprise Risk Management’ (network visualization)



**Source:** Own study.

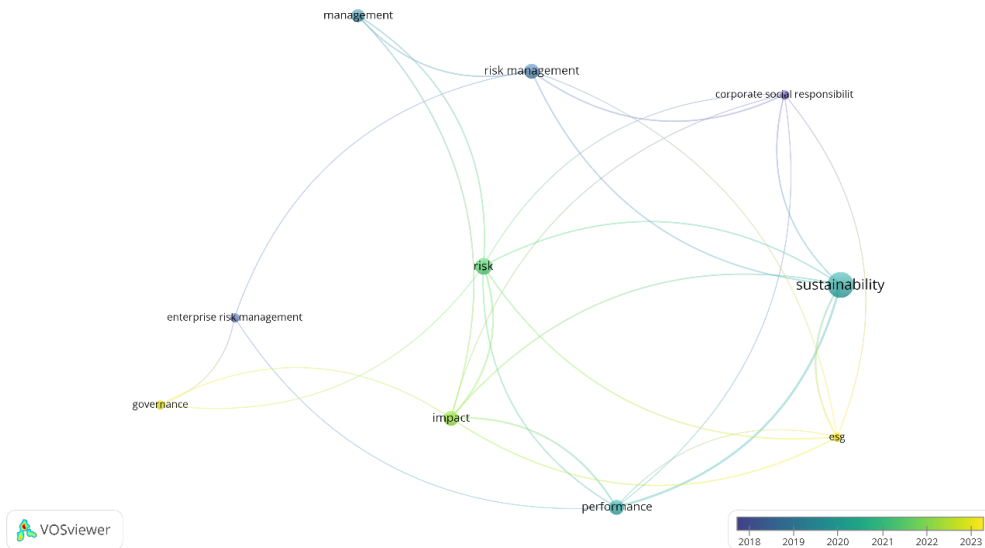
Cluster 1 (red color) includes research focused on sustainability and corporate social responsibility, including reporting standards in this area. Risk management is therefore presented here as a mandatory element of ESG reports, most often based on GRI (Global Reporting Initiative) and ESRS standards.

The second cluster, indicated by green color, centers on governance-related research, where ERM serves as a component of the integrated management system that influences long-term business performance.

This research focuses on analyzing business risks at the strategic level and their impact on the implementation of an organization’s strategic goals. A noteworthy aspect in this context is the weak connection between ERM and risk management within the framework of sustainable development (green vs red cluster), as this could create strategic risks for businesses. The final cluster (blue), like the second one, emphasizes research on management related to impacts considered in the context of risk, including both opportunities and threats.

The division of research within the clusters shows limited connections between sustainability issues and ERM. These topics are often studied in isolation, with research findings focusing on the implications for each function separately. This approach may reveal a research gap in developing the ERM function in management and reporting, not just for business risks but also for those related to the broader ESG domain. Figure 3 shows the evolution of research over time on the issues addressed.

**Figure 3.** Co-occurrences network map of keywords ‘sustainability reporting’ and ‘Enterprise Risk Management’ (overlay visualization)



**Source:** Own study.

The structure of research clusters may be influenced by the historical development of the field. As shown in Fig. 3, the earliest area of development in scientific research, dating back to 2019, was related to management broadly, encompassing risk management as a key component of building advanced integrated enterprise management systems. At that time, research on sustainable development primarily focused on corporate social responsibility.

With the emergence of reporting standards concerning sustainable development, including the GRI, the scope of research has expanded to cover a wider range of impacts—both environmental and governance—through unified indicators for monitoring these effects.

As of 2022-2023, the existing reporting standards in sustainable development require enterprises to identify impacts (risks and opportunities) resulting from their interactions with the external environment, including climate and societal factors.

Companies must also prepare organizationally to manage these impacts effectively. It can be anticipated that as new functions are developed, scientific research in this area will continue to progress, including studies that propose the evolution of internal management systems towards greater integration for sustainable development reporting.

#### **4. Discussion and Conclusions**

The Scoping Review showed that studies focused on ERM implementation and how sustainability reporting could influence organizations' performance through ERM are very limited. The current state of scientific research indicates the concentration of risk management according to the function it performs within a given area of business activity (business risks, ESG risks). However, this approach may result in the development of numerous independent methodologies and risk registers within organizations, which operate in parallel but are not interconnected. Consequently, this lack of integration can hinder effective management decision-making within the organization.

Only a few recent studies directly address the problem of integrating SR into ERM. All these studies indicated that risk management represents a challenge for organizations, as it includes ESG issues that can negatively impact organizations' investments.

Yazo-Cabuya *et al.* (2024) proposed a general approach for prioritizing organizational risks focused on sustainability, which is applied in a particular case. Based on the analysis of global reports such as the Global Sustainable Development Report, Enterprise Risk Management-Integrating with Strategy and Performance, and the Global Risk Report, five typologies of organizational risks with a focus on sustainability (geopolitical, economic, social, technological, and environmental) that support the concern for sustainability in organizations are characterized, taking into account viability and equitability.

Shad *et al.* (2019) conceptualises a framework that examines the moderating effect of sustainability reporting practices on the relationship between ERM implementation and business performance. Recent studies highlight also the growing pressure on companies from stakeholders regarding non-financial reporting, particularly in the area of ESG reporting. Su *et al.* (2022) indicated that organizations should be transparent about their performance and accept responsibility for their impacts on society and the environment.

ESG-related activities should be cascaded to company subsidiaries, especially those that employ internally separated processes, operate globally and are responsible for end-to-end processes. Based on an analysis of financial statements, few entities currently even consider operational risks, including ESG-related risks.

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Thus, the promotion of ESG practices in organizations currently represents the most critical factor. As Crawford & Nilsson, 2023 (Crawford and Nilsson, 2023) rightly emphasizes, transparency and accountability demands around ESG risk control and reporting increase, pressure is mounting on organizations to act as good corporate citizens. These Authors underlined that one way to meet these challenges is to integrate ESG risks into ERM to improve control and reporting.

Referring to EU environmental reporting standards Paksiová (2017) underlined that CSRD is important for the sustainability, competitiveness, and innovation of EU enterprises and the EU economy. It brings benefits for risk management, access to capital, cost savings, human resource management and customer relationships.

However, studies indicated also many challenges related to CSRD implementation. In their research, Primec and Belak (2022) asked whether companies will be better prepared for environmental and social risks, and therefore better manage for sustainability once the CSRD is in place? The results suggest that the qualitative part of the non-financial reporting is the weakest. This gap in the quality of (required) non-financial reporting is also the subject of the presented research, which shows the (non)quality of the present non-financial reporting and therefore justifies the development of further requirements.

The challenges of implementing SR into ERM were also investigated by Guo *et al.* (2024). Using Chinese A-share listed companies from 2006 to 2013 as the research sample, the Authors empirically examines the impact and mechanism of the mandatory CSR disclosure policy on Chinese firms' risk-taking by combining the difference-in-differences (DID) approach.

This study finds that the implementation of the policy increases firms' operating costs and leads to an increase in their financing constraints, which ultimately creates a disincentive for firms to take risks.

To sum up conducted literature study, integrating sustainability reporting into ERM helps companies manage both traditional and emerging risks, ensures compliance with evolving regulations, boosts stakeholder confidence, and drives long-term value creation. In a world where sustainability is increasingly linked to financial and operational performance, this integration is not just a best practice but a necessary strategy for resilience, growth, and competitive advantage.

However, EU regulations set high requirements in this area. Integrating the ESRS into ERM is a complex challenge, requiring businesses to adapt their risk frameworks to accommodate ESG risks. The challenges include data complexity, regulatory uncertainty, expertise gaps, and ensuring the credibility of sustainability efforts. However, overcoming these challenges is essential for businesses to stay competitive, ensure regulatory compliance, and manage the long-term risks associated with sustainability in a rapidly changing global environment.

Therefore, it is necessary to develop best practices, with the participation of researchers and practitioners, which will support organizations in integrating SR into ERM. Future research should focus on proposing integrated ERM methodologies that encompass not only business risks but also those identified in the SR domain.

This approach would enable companies to streamline their processes for risk identification, assessment, and reporting, providing effective tools that support management decision-making by considering all potential opportunities and threats.

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