A T-Shaped Perspective for Building Holistic Sustainability Reporting in the Digital Era

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In the last three decades, the increasing attention around the sustainability has stimulated several international debates about the topic of performance measurement approaches. With the aim of conceptually addressing the multiple challenges behind sustainability performance measurement, the paper explores how recent sustainability reporting regulations, particularly the Corporate Sustainability Reporting Directive can foster a holistic approach. Thanks to the support provided by the T-Shaped logic and the Systems-Thinking approach, a conceptual model is proposed to analyse role, condition, and contribution of ongoing digital transition on sustainability management and sustainability performance measurement. Reflections herein provide insights for researchers, professionals, and policymakers on integrating specialized skills with broader capabilities to better capture the contextual and subjective dimensions of sustainability. The originality lies in proposing an innovative conceptual framework for bridging specialized competences with inter- and multidisciplinary capabilities in sustainability reporting.

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1 Introduction

Over the past decades, the persuasive nature of sustainability has sparked a multi- and interdisciplinary debate involving several research communities from multiple scientific fields (Saviano *et al.*, 2017). Scholars and professionals have progressively focused their attention on the ways through which quantifying and measuring the 'dimensions' of sustainability (Mura *et al.*, 2018). Taking note about the increasing relevance that sustainability performance measurement is acquiring for practitioners, researchers, and policy makers, it is important to highlight the intrinsic economic and social complexity of sustainability and sustainable development (Caputo *et al.*, 2018), and on the need to adopt a holistic approach for capturing their peculiarities (Hadorn *et al.*, 2006). In contrast to this need, it seems that current approaches to defining of sustainability performance indicators is affected by a predominantly reductionist approach, as shown in the current European Directive (Gnanaweera & Kunori, 2018). In such a direction, the Corporate Sustainability Reporting Directive (CSRD), aims to expand the scope of companies subject to sustainability reporting obligations (Hummel & Jobst, 2024) and to define a common perspective for measuring economic, social, and environmental impacts without considering the context and subject-specific features of companies subject to the new regulation (Pantazi, 2024). It seems that the CSRD suffers from a highly specialized approach that does not consider external environment as a relevant factor that affects companies' approach to performance measurement (Pizzi & Coronella, 2024). Following these preliminary reflections, the paper aims to enrich the existing literature on sustainability performance measurement by underlining how the CSRD can represent a catalyst in the evolution from a reductionist approach to a holistic one, reflecting the core principles of sustainability science. In such a vein, this contribution wants to address the following research question: "How can specialized competencies be integrated with inter- and multidisciplinary capabilities for ensuring and effective, viable, and participative approach to sustainability reporting?"

In particular, the research contributes to the conceptual advancement in the field by integrating the T-shaped model and the Systems-Thinking approach in the research field of sustainability science. Additionally, digitalization is approached as a key driver to implement effective and pragmatic sustainability actions (Caputo *et al.*, 2023). In summary, the rest of the paper is structured as follows: Section 2 provides the theoretical background on which reflections herein are developed; Section 3

briefly describes methodological approach adopted; Section 3 proposes a possible conceptual model, and Section 4 presents preliminary conclusions of reflections herein.

2 Theoretical Background / Literature Review

In today's world, where sustainable development is becoming more complex and interconnected, sustainability science is stepping up as a vital field that blends different disciplines and approaches. Its goal? To create both theoretical and practical knowledge that crosses the usual boundaries of various fields (Barile *et al.*, 2018). This approach pushes back against the narrow focus of individual disciplines, which often fall short when tackling big global issues like climate change, biodiversity loss, resource depletion, and social inequality (Freund *et al.*, 2024). Grounded in systems theory, sustainability science is all about solving problems rather than sticking to traditional academic silos (Aronson, 2011). It calls for teamwork among universities, policymakers, businesses, and communities (Spangenberg, 2011). This shift emphasizes the need for transdisciplinarity as a key scientific principle, allowing for the blending of various knowledge sources to collaboratively tackle complex societal challenges (Lang *et al.*, 2012). In this context, recent changes in European regulations have helped shape a more comprehensive view of sustainable development, sparking international discussions on how to integrate multidisciplinary, interdisciplinary, and transdisciplinary approaches (Yarime *et al.*, 2012). According to Golinelli *et al.* (2015), it's crucial that science, politics, business, and society collaborate closely, especially in corporate and institutional decision-making ().

In today's ever-changing landscape, the Corporate Sustainability Reporting Directive (CSRD) marks a significant regulatory change through the principle of double materiality. This means organizations must report not only on how their activities impact environmental and social systems but also on how sustainability issues influence their financial performance (Baumüller & Grbenic, 2021). It takes the place of the Non-Financial Reporting Directive (NFRD) and greatly expands the scope and responsibilities of sustainability reporting, now including all large companies and listed small and medium-sized enterprises (SMEs). This duality adds a layer of complexity to sustainability reporting, especially with the digitalization requirements (like XBRL tagging) aimed at enhancing transparency and comparability (Atanasov,

2023). Tackling this complexity calls for a model that can effectively bridge both depth and breadth of knowledge—a challenge that the T-shaped model is well-suited to meet.

The T-shaped concept, which was initially introduced to describe professionals who possess deep expertise in one area (the vertical bar) while also having broad collaborative skills across various fields (the horizontal bar), could be a valuable framework for understanding sustainability reporting (Barile *et al.*, 2012; Barile *et al.*, 2016). Unlike "I-shaped" specialists, T-shaped professionals are better equipped to navigate systemic complexity, integrate knowledge from different areas, and facilitate more comprehensive decision-making. In the context of the CSRD, this model provides a conceptual foundation for interpreting the relationship between technical ESG compliance and strategic sustainability management. While the vertical competencies tackle the regulatory and data-intensive requirements of the directive, the horizontal aspect enables organizations to incorporate sustainability into broader strategic and stakeholder considerations.

This means that fostering T-shaped skills within organizations helps them better integrate digital technologies, balance data and insights, and manage both regulatory and innovation challenges in sustainability (Saviano *et al.*, 2019a). Even though there's increasing focus on these dynamics, more research is essential to delve into the cognitive and subjective factors that influence digital transitions in sustainability reporting and how these factors interact with the changing regulatory landscape (Hristov & Searcy, 2024).

3 Methodology

This study takes a conceptual and interpretative approach, grounded in systems thinking and enhanced by a transdisciplinary perspective (Bryman, 2016). Instead of leaning on empirical data, the paper offers a theoretical reflection that delves into how recent changes in sustainability regulation -particularly the CSRD- can shift from a reductionist viewpoint to a more comprehensive framework that aligns with the fundamental principles of sustainability science.

The methodological design utilizes T-shaped logic (Barile *et al.*, 2012; Barile *et al.*, 2016) as an interpretive model that effectively combines depth (specialized knowledge) and breadth (interdisciplinary insight) in the field of sustainability performance measurement. Through this perspective, the research introduces a conceptual model that links three essential elements: (1) the epistemological foundations of sustainability science; (2) the regulatory demands of the CSRD; and (3) the supportive role of digitalization processes.

Moreover, thanks to the insight provide by the systems-thinking approach (Barile *et al.*, 2018), the proposed model is built on recursive reasoning that reflects the ongoing interaction between individual and collective viewpoints.

4 Results and Discussion

By adopting the 'T-shaped' logic, organizations could overcome a reductionist view on which sustainability performance measurement seems to be actually based through the synergistic integration of both vertical capabilities and horizontal competencies. In such a direction, the T-shaped offers the opportunity for capturing and understanding the multiple dimensions of sustainability combining individual approaches within collective expectation (Caputo *et al.*, 2019).

Following this conceptual line, it clearly emerge they key role that digitalization processes and the digital technologies can have in ensuring the combination between actors and community through recursive loops. Thanks to the digital technologies it is possible to link horizontal trans-disciplinary approaches to sustainability with vertical specialized capabilities required by the sustainability reporting guidelines without reducing sustainability performance measurement to 'simple' standard to which align companies' behaviors and decisions (Caputo *et al.*, 2021).

The digital age offers an effective opportunity for shifting from a reductionist to a holistic view through the promotions of extensive participation based on the active contributions of all the stakeholders interested in sustainability performance. In such a vein, the correct implementation of the CSRD becomes a catalyst for this paradigm shift, emphasizing the importance of integrating quantitative and qualitative dimensions through digitalization. By combining a multidisciplinary horizontal perspective with the vertical and technical competencies of the actors involved in

sustainability communication, the CSRD fosters a better balance between strategic objectives and actors' specialization. This synergy not only simplifies compliance with regulations but also enables organizations to provide a holistic understanding of the three-dimensional impacts.

The conceptual logic through which such a change is possible is show in Figure 1.

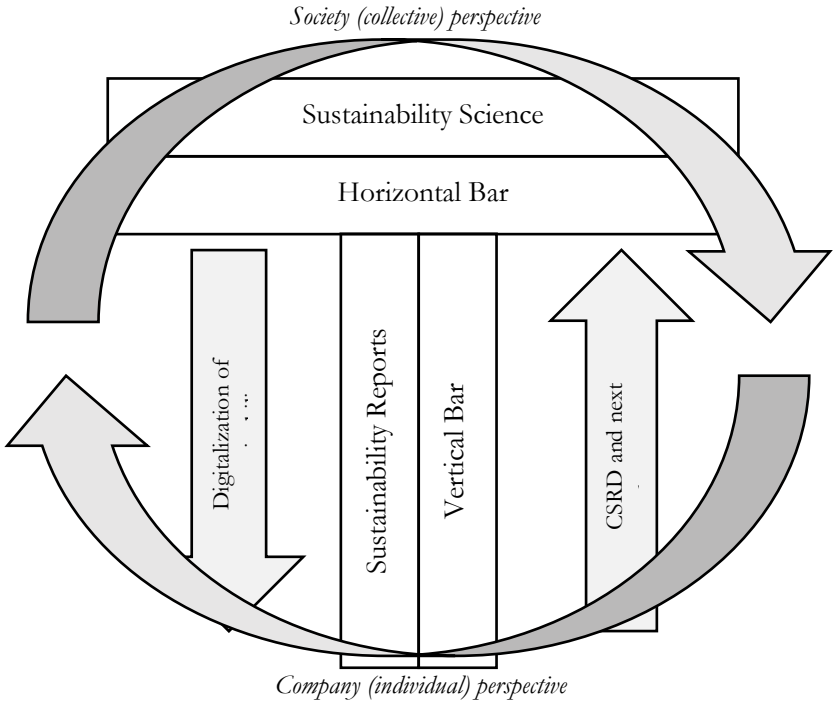

Figure 1: The conceptual model
Source: Authors' elaboration, www.asvsa.org

The model shown in Figure 1 outlines the recursive path on which sustainability is based. According to the model, sustainability reports can be considered as an 'artifact' of sustainability science and their features cannot be analyzed without considering the ways in which 'Society (collective) perspective' and 'Company (individual) perspective' interact. Thanks to this representation it is possible to depict the role that digitalization and sustainability guidelines have in the evolutionary path of sustainability science and behaviors. Basically, while digitalization acts as a catalyst

of sustainability science offering the opportunity for developing tangible outcomes, instruments, and tools that companies and individual actors can use, on the other side, the CSRD and the next sustainability reporting guidelines should be 'abstract' actors' expectations through the definition of an average levels on which to build the next steps in the evolution of sustainability science.

5 Conclusions

For a long time, sustainability has been approached in social and managerial studies in terms of standards to which align companies, organizations, and actors behaviors (Caputo *et al.*, 2020). This approach can be considered as the consequence of a widespread reductionist approach interested in standardized social dynamics through the definition of common protocols and unique rules through which define metrics and rankings (Saviano *et al.*, 2019b). Such approach is unable to catch the multiple dimensions of sustainability and its application with references to the sustainability disclosure and reports has only produced multiple divergent guidelines increasing complexity for companies and practitioners.

Thanks to the adoption of the T-shaped logic and the Systems-Thinking approach the paper has outlined the possibility for linking collective and individual perspective in a common framework clarifying – at the same time – the key role that digitalization processes and reports guidelines could have in ensuring an effective and viable evolution of sustainability science.

The model only aims to clarify the conceptual logic on which the increasing effort of practitioners, researchers, and policy makers about sustainability should be based. In line to this purpose, the paper also wants to recall the attention on the need for recombing individual and collective perspectives under the common framework of sustainability science (Caputo *et al.*, 2023b). Without this expected balance, sustainability risks losing its identity and could become another useless standard unable to give the attention to the changing dynamics of socio-economic evolution.

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