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Social Impact Measurement & Balanced Scorecard: A Review of Design, Effectiveness and Limits

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Abstract

Balanced scorecard (BSC) has seen intensified scrutiny from academia in terms of its ability and effectiveness in driving sustainability goals. Additionally, the wider topic of organizational social impact measurement has seen similar debates around what can be considered a proper outlet for performance and control tracking. It also remained unresolved the need for a sustainability and/or social impact measurement solution that is standardizable, consistent, effective in achieving its goals and integrated in the corporate strategy. This paper takes on a journey of systematic literature review aiming to address whether a social impact measurement scheme can be effectively incorporated into existing performance monitoring & control systems. Following this approach, it investigates the space created around Balanced Scorecard (BSC), sustainability -as a benchmark in assessing their 'co-existence'- and social value. The aim is to answer 2 research questions: (1) What are the missing links when it comes to achieving an integrated and standardizable approach in corporate sustainability and social impact measurement? (2) Is it effective to use BSC based design to monitor and track the corporate sustainability and/or social impact of an organization? This study analyzed 69 papers published between 2010 and 2024 and indexed on ISI Web of Science - Current Contents. These papers underwent comprehensive analysis with the help of Endnote and NVivo. Subsequently a refined sample of 40 papers, directly related to the research questions, was isolated. The findings of this study show that although existing infrastructures for performance management (i.e BSC) could be redesigned so that they can incorporate additional social impact measures, there are significant limitations in terms of effectiveness. It suggests that given the complexities of a social impact measurement endeavor, essential foundational elements of effective measurement and integration need to be addressed first. This implies having a tailored approach in the setup of performance tools able to effectively support the social impact measures endeavor.

Keywords: balanced scorecard; measuring corporate sustainability; social impact,; integrated view

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1. INTRODUCTION

The topic of social impact measurement has seen in recent years wealth of contributions primarily concentrated on methodologies and conceptualizations leading to articulations of distinct constructs. Systematic review works shed a light on strengths and weaknesses in existing methodologies (Pazienza, De Jong, Schoenmaker, 2023), source of complexities (Hahn & Figge, 2018) and potential limitations to be addressed with future research (Mio, Constantini, Panfilo, 2021). However, as the space of social impact measurement itself is relatively young, it remained still unsettled a state of the art focused on what drives the operationalization of social impact measures on a consistent basis across various types of organizations and subsequently what are the approaches that allow standardization.

This endeavor is triggered by one prominent gap in social impact measurement which takes the form of the lack of consistency or holistic approach across organizations and sectors. Recent systematic review works (Pazienza, De Jong, Schoenmaker, 2023) directed the conversation around the source of the existing gap following Gary Goertz's guiding principles on how to measure social science concepts (Social Sciences Concepts and Measurements, 2020).

In the same context yet emerging from a different entry point, an academic debate around one specific methodology, balanced scorecard, had as a central theme the idea of architecture of the balanced scorecard allowing incorporation of sustainability topics (Hasen & Schaltegger, 2018) vs on the other side of the debate, the fallacy or irrelevance of architecture when considering the ability of balanced scorecard to incorporate sustainability or social related themes (Hahn & Figge, 2018).

Even though this debate was focused on a very specific, well-established tool in the organizational environment, it opened up deeper considerations on the larger topic of social value measurement and its inherent challenges. Two anchors tend to stand out and subsequently shape this debate: (1) ability to address inherent tensions and complexities within organizations into strategic frameworks thus allowing higher elasticity when incorporating long term and/or non-financial goals or societal impact measures (2) ability to operationalize more 'unorthodox' or nonlinear architectures on scorecards allowing to incorporate, address, track and monitor progress on societal measures.

Ultimately, both schools of thought contributed to knowledge expansion while building the arguments on either developments on the architecture and emerging typologies (i.e non hierarchical, semi hierarchical, flat) leading to more flexibility to organizations with different ambition levels for sustainability (Hasen, Schaltegger, 2018) or, on the other side of the debate, on foundational aspects preventing effective incorporation of social themes into the tool (Hahn & Figge, 2018).

Looking to fill the gap on what makes, drives and sustains the implementation and standardization of social impact measures, we perform a systematic review on academic papers in sustainability and social impact measures in ISI Web of Science - Current Contents, using published scientific work to look back into the past and identified tendencies to anticipate the future.

We critically compare and aggregate existing contributions from scientific journals with impact from 2010 to 2023 obtained from a search on sustainability, social impact and balanced scorecard which led to an initial sample of 253 scientific papers.

Next we export the set to Endnote 21 and perform a first selection of valid results. This process resulted in additional filtering thus delivering a sample of 40 scientific papers. Finally, we perform content analysis to identify key journals, authors, methodologies for social impact measurement as well as key research questions and future research directions for research path identified in the previous phase. We use NVivo 15 to build thematic maps.

Our paper is organized as follows. First, we describe in the methodology chapter the process undertaken to reach a working, additionally filtered sample of 40 scientific papers. Second, we present the results obtained from the systematic literature review, namely descriptive statistics on relevant sample, as well as top authors, publication years, top journals and literature maps with key identified schools of thought and key thematic areas of study. Finally, we end with a critical discussion and indicate future research directions.

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2. SYSTEMATIC LITERATURE REVIEW

2.1. METHODOLOGY

This conceptual study investigates various approaches to social impact and corporate sustainability measurements (with a focus on sustainability balanced scorecard) in the literature of the last 12 years aiming to achieve a well-rounded view (i.e., pre-requisites or foundational elements, methodological, process) on the drivers of effective, operational and standardized measures for social impact/corporate sustainability.

To this end, foundational elements offered a pathway into insights and although each referenced element has been subject to in depth analysis in previous literature reviews, the present endeavor aims to have an integrated view which is able to contribute to solving the practical aspect of achieving a standardized approach to social impact/sustainability measurement.

A search protocol was developed to support the systematic literature review (identification of keywords, planning and definition of search criteria, definition of filters and rules for valid results).

2.2. SEARCH STRATEGY

To address the objective of the present systematic literature review, Web of Science search engine was used. The search performed on Web of Science-Current Content was restricted to peer-reviewed journal articles.

The search performed had as equation "sustainability" AND "balanced scorecard", with a timespan filter of publication date between 2010 and 2023 (December 2023 as date of search). 253 results were returned.

Next, we exported the results to Endnote 21, where we performed the preliminary relevance analysis and selection of valid results based on abstracts. 69 results were delivered through this process.

The search was further narrowed to articles focused on measurement of sustainability performance and sustainability balanced scorecard where a few country specific or sector specific were excluded. A limited number of either sector specific or country specific were kept in the final set provided it opened avenues to a potential standardized approach. After this one last filtering for relevance, a selection of 40 articles were found suitable. See Figure 1 for search strategy and results.

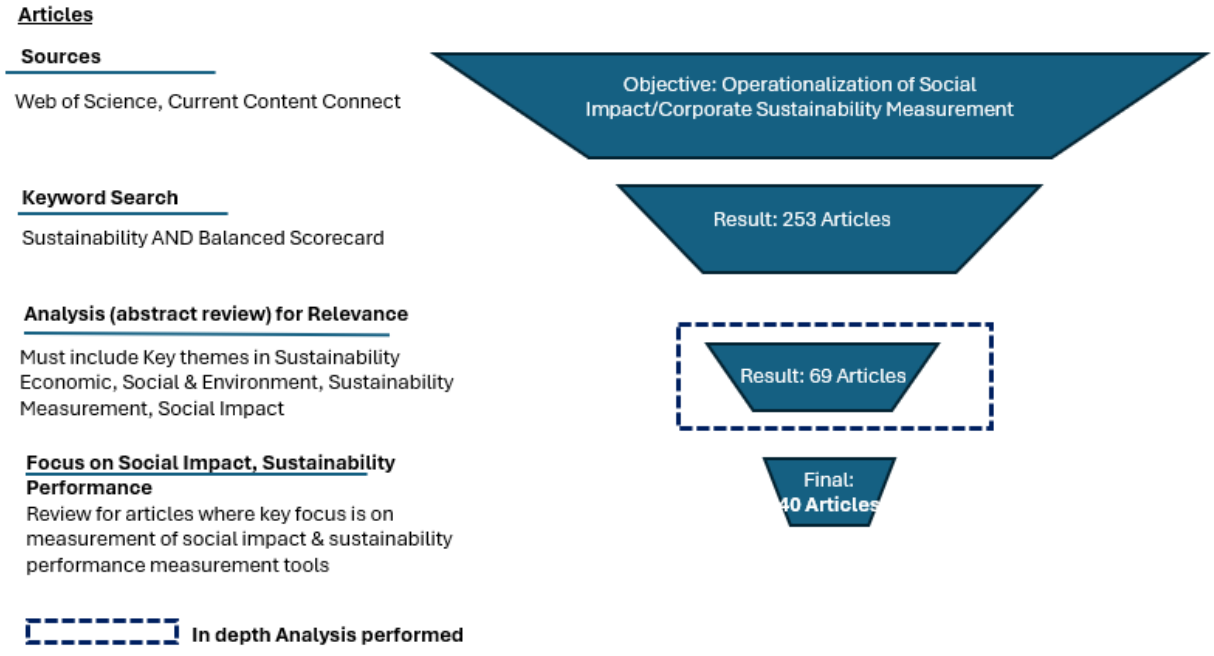

Figure 1 – Literature search strategy and results

Source: Own elaboration

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2.3. DESCRIPTIVE STATISTICS

Regarding the number of papers per year (see Figure 2), in the last 13 years, there has been an increasing number of publications in the literature on measuring corporate sustainability and sustainability balanced scorecard.

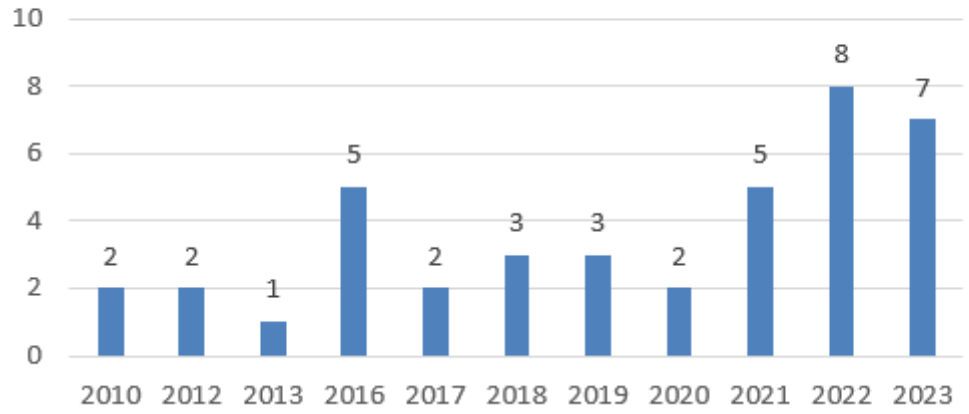

Figure 2 – Number of papers per publication year (2010 – 2023)

Source: Own elaboration

A similar tendency is observed when looking into the number of journals that published papers on sustainability measures (SM) and sustainability balanced scorecard (SBSC) over the years (see Figure 3). In 2023, the total number of journals that published papers on SM/SBSC was five.

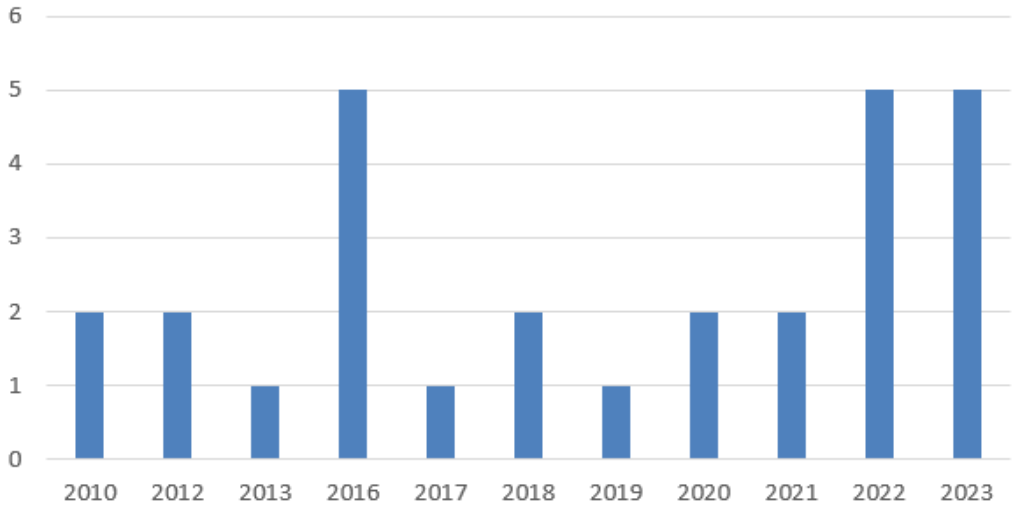

Figure 3 – Number of journals per publication year (2010 – 2023)

Source: Own elaboration

Concerning scientific journals that are most representative in terms of number of publications in the latest years (see Figure 4), in the top 5 we find Sustainability, Journal of Cleaner Production, Journal of Business Ethics and Sustainability Accounting Management and Policy Journal.

Top 5 journals represent 75% of all publications in the final working sample, indicating a concentration or specialization in publishing papers. It also signals a rather narrow or specific focus chosen as opposed to a more holistic or encompassing approach to measurement. It could also be a symptom of the complexities encountered when grappling with the sustainability measurement topic, hence the need to 'narrow down' its scope, as a reference to social systems theory (Luhmann, 1995).

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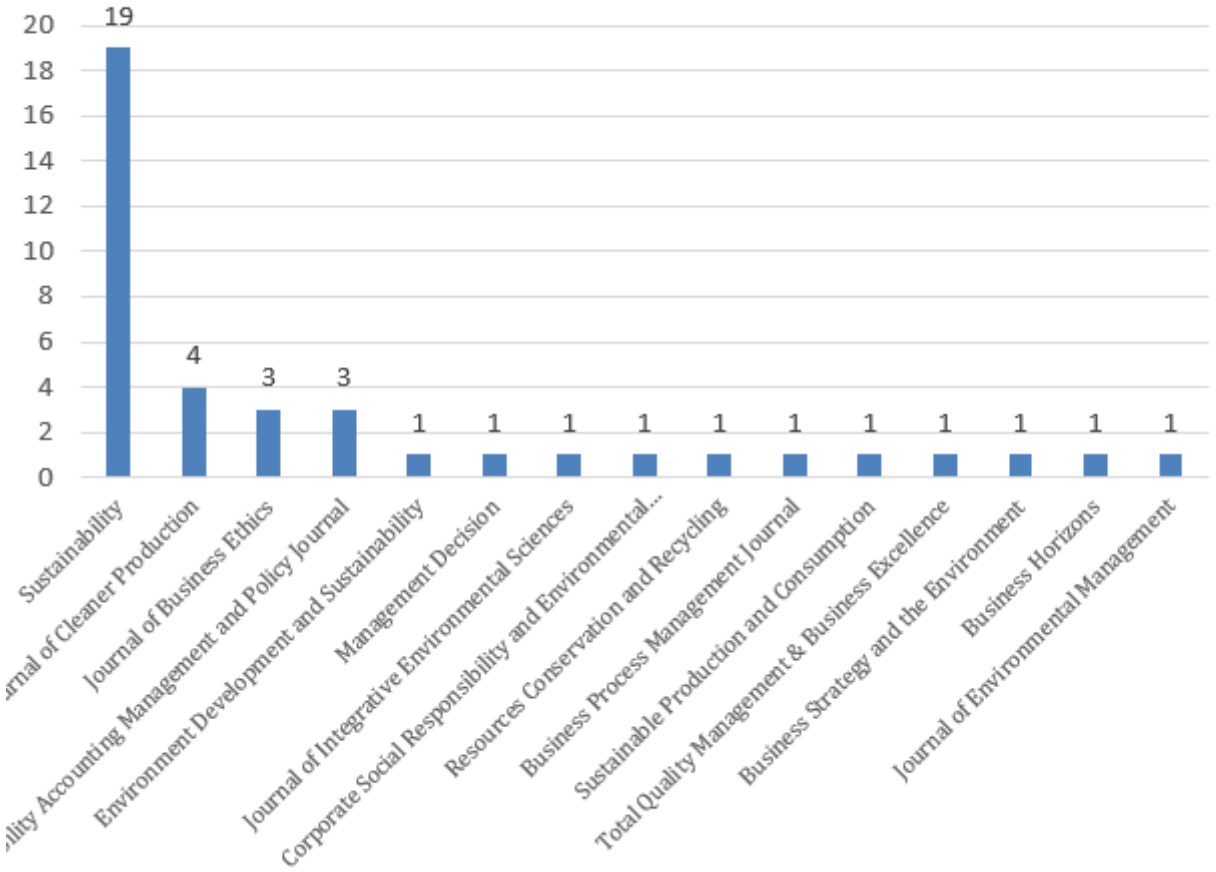

Figure 4 – Top journals in terms of number of papers published (2010 – 2023)

Source: Own elaboration

In spite of the growing popularity of the subject, the analysis of top authors (see Figure 5) illustrates that there is no specific author recognized in the field. Chirico, Hansen, Hristov and Schaltegger, the authors on top of list only published 2 to 3 papers in the last 13 years.

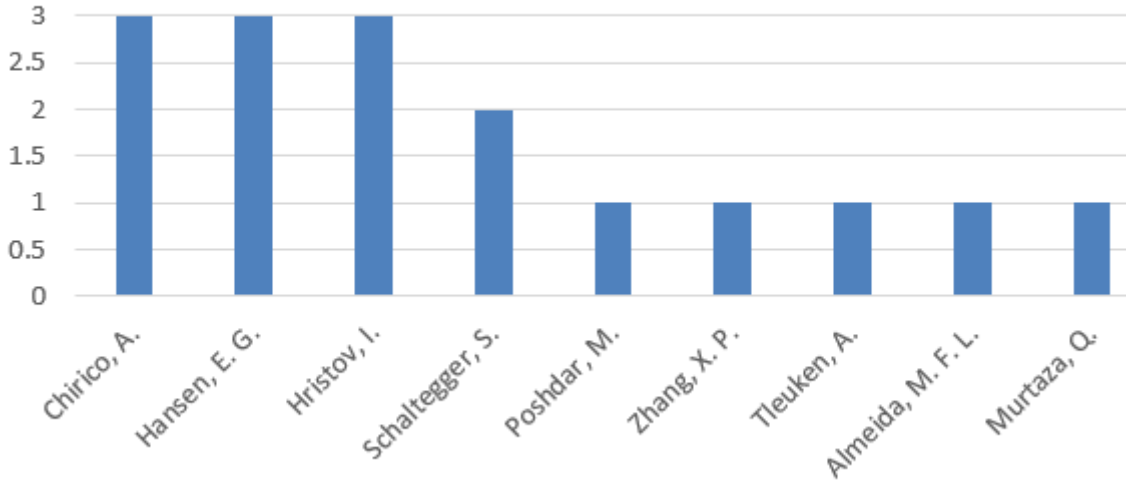

Figure 5 – Top authors in terms of number of papers published (2010 – 2023)

Source: Own elaboration

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To sum up, the subject of sustainability measurement & management performance systems (i.e sustainability balanced scorecard) shows a clear trend of increasing popularity among scholars, since the number of published papers in scientific journals with impact factor in the last 13 years, the number of authors involved and the number of journals that gave attention to the topic have grown. These are the indicators that support the argument that there is a growing interest in the field that may allow critical mass to start consolidating the field of sustainability measurement.

In the remaining part of this section, coding results are presented and explained. While the final sample included both conceptual and empirical papers (Figure 6), there was a majority of empirical ones. Looking into the distribution of empirical papers, there is a skew towards qualitative approaches signaling at a first glance a potential need for quantitative approaches.

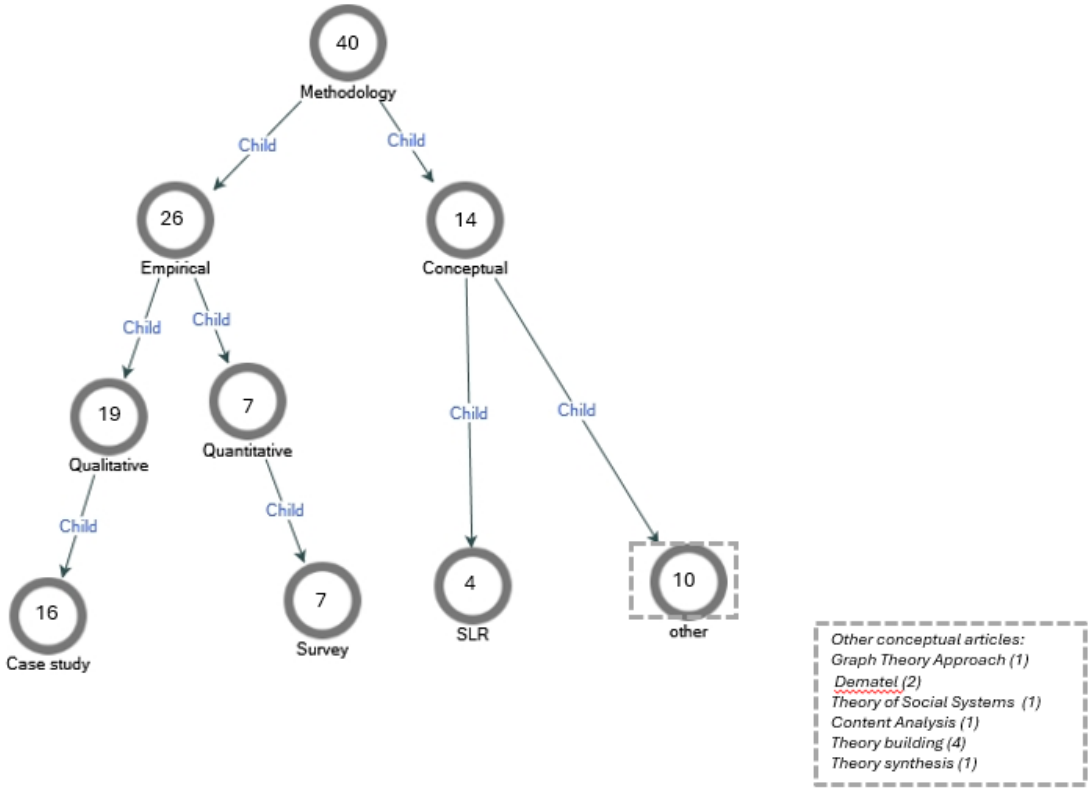

Figure 6 – Methodologies used in the papers

Source: Own elaboration

A better grasp into potential knowledge needs is given by the typology of the research questions investigated (Table 1. Overview of research questions and methods). The confusion evoked in a prior review by one of the authors present in this data set (Schoenmaker et al, 2023), is also encountered here. It is a confusion between measuring corporate sustainability (CS), providing frameworks for measuring CS -and therefore its indicators- and integrating CS into corporate practices. 3 larger clusters are present: (1) methodology development (2) process development and strategy integration and (3) concept development or theory building. (Table 1).

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Table 1 – Overview of Research Questions & Methods

Research Question	Citation	Methods
Social Indicators Assessment from CE perspective	*How to assess social indicators from a circular economy perspective?* (Bianchini, A; Guarnieri, P., Rossi, J, 2022)	Qualitative analysis
	How to propose a framework based on indicators to assess social sustainability with systematized steps? (Bianchini, A; Guarnieri, P., Rossi, J, 2022)	
	How to apply a framework to assess social sustainability and provide insightful information to decision-makers? (Bianchini, A; Guarnieri, P., Rossi, J, 2022)	
Process & Implementation of SBSC	*What are the challenges associated with the process of formulating and implementing an SBSC?* (Eifert, A; Julmi, C., 2022)	Conceptual analysis
	How can the process of formulating and implementing an SBSC be improved in practice? (Eifert, A; Julmi, C., 2022)	
	Which research gaps need to be addressed to further improve the process of formulating and implementing an SBSC? (Eifert, A; Julmi, C., 2022)	
BSC methodology	*In which segments can the BSC methodology support the digital transformation strategy, and how? (Fabac, R., 2022)*	Conceptual analysis
	Can a specific BSC digital model be developed to ensure the overall success of digital transformation initiatives, and what are its main features? (Fabac, R., 2022)	
Sustainability KPI design & integration in strategy	*What is the set of KPIs that best represent all facets of sustainability dimensions?* (Hristov, I; Chirico, A., 2019)	Quantitative analysis
	How do we integrate sustainability dimensions into the strategy of the company? (Hristov, I; Chirico, A., 2019)	
Sustainability KPIs integration	*What are the main sustainability dimensions considered relevant in the managerial practices?* (I lristov, I; Chirico, A., 2023)	Quantitative analysis
	How can sustainability dimensions be implemented into the corporate strategy to pursuit SD process? (Hristov, I; Chirico, A., 2023)	
Methodology assessment for Corporate Sustainability	*What are the strengths and weaknesses of the existing methodologies for measuring corporate sustainability?* (Pazienza,M; de Jong, M; Schoenmaker, D., 2023)	Conceptual analysis
Sustainability oriented innovation capacity modeling and KPI implementation using BSC	*How do we measure and evaluate the sustainability-oriented innovation capacity (SOIC) and performance (SOIP) of established organisations while adhering to the principles of multidimensional structure, interdependency and feedback analyses, innovation process orientation and easy implementation?* (Rocha, W., L., Almeida, M., F., Calili R., F., 2023)	Qualitative analysis
	What innovation indicators should be considered in an adapted BSC framework for modelling the sustainability-oriented innovation capacity (SOIC) and performance (SOIP) measurement and evaluation of established organisations, considering the lack of a sustainability focus in the presented literature? (Rocha, W., L., Almeida, M., F., Calili R., F., 2023)	

Source: Own elaboration

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These three areas of concern in investigating sustainability measurement ultimately provided the space to surf on in search of the wave of missing links. Figure 7 summarizes the challenge identified in the knowledge development in this field.

With progress achieved in theory building, methodological needs and strategy integration, there is still a great deal of failure on the implementation side as Schoenmaker et al (2023) noted. Moreover, the review performed in this analysis, lists the already identified, less explored spaces that are hypothesized to be the root cause that is preventing fully operational, consistent and effectively integrated measurement scheme. What it still missing is the connecting tissue between these already spotted lose ends in the knowledge. Furthermore, the academic debate between Hasen and Schaltegger (2018), on one side, and Hahn and Figge (2018), on the other side, born around balanced scorecard and its ability to integrate sustainability measures, ultimately helped shaped the unexplored space.

This unexplored space became the focus in the analysis in this review having as main goal putting 'the pieces of foundational puzzle' together as potential input in a future research endeavor. This topic is subject to review in the following section.

Figure 7. Explored spaces and uncharted territory in sustainability measurement

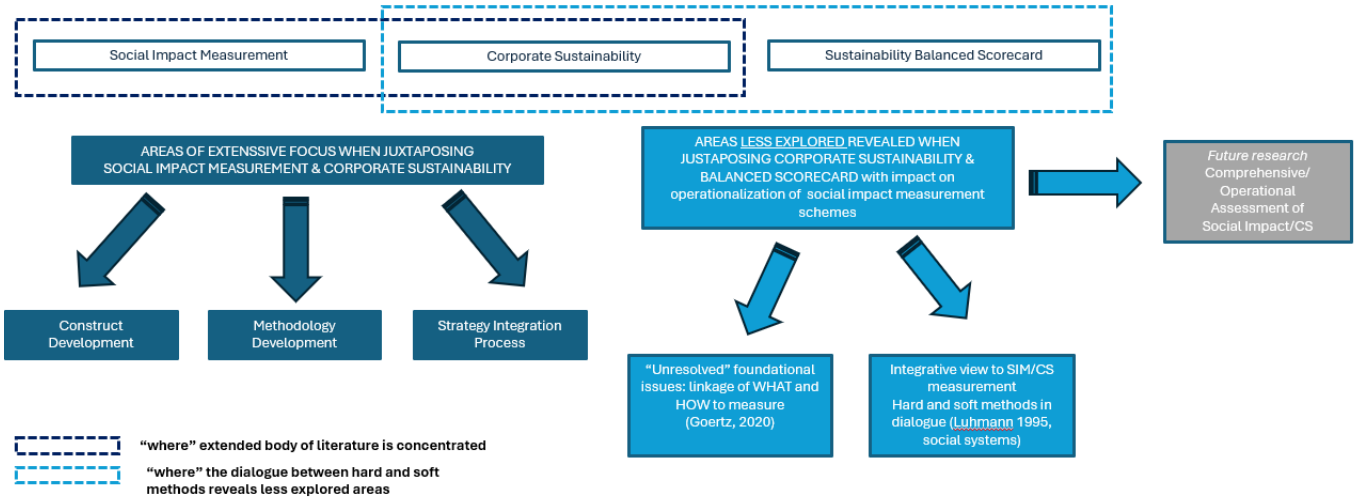

Figure 7 – Explored spaces and uncharted territory in sustainability measurement

Source: Own elaboration

Future questions (Table 2) with their territories identified cast a light on the above referenced missing links yet also invite to further guide the integration and structure for a next research endeavor. This becomes the focus area in the next section in which these missing links are reviewed with the goal of completing the picture on pre-requisites in a journey towards a fully operational, consistent, integrated and standardized measurement scheme.

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Table 1 – Overview of Future Research Questions & Themes

Future research	Citation
Sustainability integration and BSC	*"This research study suggests that the BSC is an enabling framework for integrating sustainability reporting into the management control system given its ability to operationalize sustainability reporting objectives and communicate these via a formal reporting framework.* *But there are also benefits that sustainability reporting provides to the BSC in "an expanded bottom line" as well as increasing interactions with stakeholders.* *Further research into the interaction between these two systems would increase the understanding of the causal mechanisms at work. "*(de Villiers, C.; Rouse, P.; Kerr, J; 2016)
SBSC KPI definition and development of **cause-effect chains**	*"Future research should therefore also look at how this semi-structured process actually unfolds in companies. In particular, strategy-as-practice research could be a promising approach to investigate the procedural and social aspects of developing cause-effect chains and formulating KPIs".* (Eifert, A.; Julmi, C., 2022)
Fundamentals when incorporating **sustainability measures: integrative view and instrumental view**	*"The instrumental view and the integrative view represent two alternative perspectives on how economic, environmental and social aspects of sustainability relate to each other, where the former focuses on alignment and the latter allows for contradictions and tensions. The integrative view addresses some of the most relevant aspects that the SBSC fails to meet. Below, we develop opportunities for future research to show how the integrative view offers an alternative perspective to overcome the shortcomings of instrumental approaches such as the SBSC."* (Hahn, T.; Figge, F., 2018)
Fundamentals of SBSC or how does the **balancing** act happen	*"Regarding the 'SBSC in use', perhaps the most important avenue for further research is to be found in studying the process of how managers make trade-offs—that is, the actual 'balancing'—among the various SBSC goals, also when considering the three different hierarchies. "*(Hahn, T.; Figge, F., 2018)
Design: Role of architecture of SBSC Foundational or common understanding across stakeholders: meaning of sustainability	*"Evolution is important for the SBSC as, according to Sundin et al. (2010), it is not a "fixed structure". Longitudinal studies are needed to critically reflect on and understand the organizational learning processes triggered by the SBSC. What effects, for example, do the visualization of strategy maps and the acceptance of trade-offs have in practice, and subsequently, how has the SBSC architecture been modified over time (along the two dimensions suggested in the present paper)? How does the evolution of contextual variables like the value system and the corporate sustainability strategy influence the SBSC architecture?* *...about the role of the SBSC in developing a common understanding of what sustainability means for the company and its stakeholder network, and of SBSC projects for interaction about what measures and processes would best enhance sustainability management and organisational learning processes. Last but not least, why and how are SBSCs abandoned or gradually phased out? Is it for instance due to managerial succession (e.g. Hansen and Spitzeck 2011)?"* (Hansen, E.G; Schaltegger, S; 2016)
Sustainability KPIs for **system level impact**	*"How the integration of such sustainability indicators into a management control system such as the SBSC could be achieved with positive impacts on a system level and on the organization is a worthwhile area for future research".* (Hansen, E.; Schaltegger, S.; 2016)
Index and Methodology development in sustainability measurements	*"Future research should take place in empirical testing of the feasibility aspect related to the proposed SIs based on SMEs and finding the way to enable SMEs to achieve sustainable performance and support entrepreneurs' decision-making processes regarding resource allocation and monitoring of the allocation impact according to the list of proposed SIs. Proposed indicators can also be condensed and aggregated into a single metric, commonly referred to as "index"."* (Hoinik, J.; Biloslavo, R; Cicero, L; Cagnina, M.R.; 2020)
Executional: Role of empirical validations for implementation and diffusion of sustainability culture where SDGs are implemented in business strategy	*"In future research, it will be essential to test the model through a case study, by implementing it in a real context. This will represent an important step in increasing the implementation and diffusion of sustainability culture in companies that include SDGs in their business strategy. "*(Hristov, I; Chirico, A; 2019)

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3. KEY THEMES GOING FORWARD IN SOCIAL IMPACT/CORPORATE SUSTAINABILITY MEASUREMENT

3.1. LINKING "WHAT" AND "HOW" TO MEASURE

The literature review performed by Schoenmaker et al (2023) focused on strengths and weaknesses of the existing measurements of corporate sustainability in the last 12 years by applying Gary Goertz's guiding principle of how to measure social science concepts, as outlined in "Social Science Concepts and Measurement, Goertz (2020)". In his work Goertz posits that a concept cannot be measured until it is properly constructed and defined in its constitutive features and their relationship is established.

In their work, Schoenmaker et al (2023) also build on previous work (Pazienza et al) while referencing the finding that corporate sustainability has three necessary and jointly sufficient constative pillars identified with the economic, social and environmental dimensions. In summary, the work (Schoenmaker et al, 2023) states that to be able to measure the concepts of corporate sustainability, the following guidelines should be followed:

- The concept must be properly defined in its constitutive pillars
- The constitutive pillars are necessary conditions and imply non-substitutability
- Proposed measures must be properly linked to the identified concept and data aggregation must align
- The concept must be defined in its highest extension

Although the measurement of the sustainability/social concept itself is not in the scope of this review, the very outcome or the essential qualities of measurement endeavor (i.e consistency, standardization, effective operationalization) triggered it and had as consequence the need to revisit its fundamentals.

In the systematic literature review performed with this present work, the principle highlighted above is identified as a first step or ground zero in a measurement endeavor with the needed qualities. As a result, the extensive range of concepts already generated by the existing body of literature needs to be reassessed though this lens.

3.2. DIALOGUE BETWEEN HARD AND SOFT METHODS AND DESIGN OF PERFORMANCE MEASUREMENT TOOLS

Another valuable foundational input has been identified with this present systematic literature review work while analyzing the dataset, and it is rising from the conceptual debate between Hasen and Schaltegger (2018) and Hahn and Figge (2018). In summary the central subject in this referenced academic dialogue was the balanced scorecard as a widely used and referenced tool in both practice and academia, where one side argued the idea that architecture or new updated versions of balanced scorecard architecture allow effective inclusion of sustainability topics (Hasen & Schaltegger, 2018) while the other side argued on the fallacy or irrelevance of architecture when considering sustainability topics (Hahn & Figge, 2018).

Beyond the rich argumentation created on both sides of the debate, it opened a larger and potentially deeper avenue that leads right to the heart of social systems theory (Luhmann, 1995). "Luhmann's theory posited that modern society can be described as a collection of multiple systems constituting each other's environments. While the range of possible human actions and experiences are infinite, in the system they are limited to a selection of actualized possibilities. This is because the individual mind, overwhelmed by human civilizational complexity, tends to simplify reality through the process of "complexity reduction" (Valentinov 2014).

In this process, "*systems compensate for their inferior complexity by becoming insensitive to the complexity of the environment*" (Valentivov 2014). In other terms, systems increase complexity by reducing complexity. This 'complexity-reduction principle' is doubled with the 'critical-dependence principle' whereby systems develop insensitivity to environmental factors on which they critically depend, thereby undermining their own sustainability" (Chaker et al, 2021).

One potential avenue to build on is spotted through the work done by Chaker and colleagues (2021) where the much-referenced subject of debate, Sustainability Balanced Scorecard (SBSC) is main hero once more. The authors state that their work demonstrates that redesigning the SBSC's architecture according to their

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proposal leads to embracing complexity, tensions, and conflict (i.e., soft methods) all the while offering a systematic approach for properly identifying and quantifying cause-effect relationships (i.e., hard methods). Further building on social systems theory, the authors concluded that the integration of varied and sometimes outwardly opposed function systems can and must be carried out to achieve larger societal impact. In this sense they argue that the emerging dynamic SBSC offers a viable strategic planning platform whereby managers and stakeholders can concurrently define, forecast, and adjust the societal strategy that maximizes triple bottom-line indicators and sustainable development impact.

As a limitation, Chaker and colleagues (2021) also acknowledged that the process may demand some adjustments as we move across various function systems which requires solid knowledge and understanding of the underlying codes that define the systems subject integration. Essentially this construct picks up on the tendency of reductionism salient in the literature whenever wrestling with sustainability concept and that was also noted in the review performed by Schoemaker et al 2023. One may nonetheless argue that a shorthand might have been applied when finding the landing in SBSC. The redesigned framework of SBSC to reflect integration between hard and soft methods can be seen as a subject for further testing as the authors also suggest. The richness of the case built with Chaker and colleagues (2021) contribution resides in signaling the need for a true system thinking approach through this dialogue between hard and soft methods. Whether the referenced and widely spread performance management tool (i.e SBSC) is indeed a viable solution, we argue that it may be 'a few steps ahead' in the larger discussion. Once the underlying principle finds its home, the next step might be fitting all foundational pieces as input variables in designing a measurement scheme. Road testing and fine tuning might be a second step in the validation process. This final argument will be picked it in the last section of this chapter.

3.3 INTEGRATIVE VIEW

The integrative view comes as another foundational element developed in the work produced by Hahn, Figge (2018). Essentially, it's a view that argues that firms need to embrace contradictions and tensions to achieve substantial contributions to sustainability (Gao and Basal 2013; Berger et al 2007; Hahn et al. 2015). Integrative view "refers to an approach to business sustainability that embraces the contradictions among the financial, social and environmental dimensions (and) dies not dismiss the tension between business and society by emphasizing one performance measure over another, nor does it downplay the incessant tension between stakeholders" (Gao and Basal 2013).

There are two critical consequences for the firms embracing the integrative perspective, as noted next:

(1) "Under integrative view firm will not, a priori emphasize financial outcomes at the firm over social and environmental outcomes (Hahn and Figge 2011, Gao and Basal 2013). This does not mean that firms need to completely abandon profit orientation. However, the implementation of more transformative and proactive sustainability strategies might well require firms to address sustainability challenges early on when the benefits are still unclear (Rivoli and Waddock 2011) and to engage with fringe stakeholders with little or no direct business relevance (Hart and Sharma 2004)."

(2) "Embracing tensions and contradictions in the management of corporate sustainability strategies means that firms pursue different sustainability objectives even if they are contradictory. However, the ongoing management of tensions where decisions makers navigate tensions and keep the contradictions between different objectives open cannot be fully planned. Rather it requires firms to develop capabilities and management modes that promote everyday improvisation (Fenwick 2007) and create conditions and incentives that foster emergent sustainability strategies (Andersson and Bateman 2000; Markusson 2010; Sharp and Zaidman 2010)."

As an overarching conclusion, the authors observe that "explicitly accepting the ambivalence and inconsistencies around sustainability issues as with integrative vie helps overcome managerial illusions of control" (Das and Teng 1999) and impels decision makers to depart from established business as usual routines and to consider a wider set of responses to sustainability challenges (Plambeck and Weber 2009)".

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This might be the most demanding so-called foundational element yet wrestling with it while road testing viability of any measurement scheme becomes implicit. It has been noted in the literature that measuring societal impacts is premised on commesurability or the ability to meaningfully quantify and compare qualitatively different issues and types of behavior (Arjalie & Basal, 2018). Integrating different types of impact also requires establishing weights that represent the relative importance of each type of effect, begging the question of what benchmark to use for doing so. (Wijen, 2023).
In practical terms, the demanding nature of operating under this proposed integrative view, invites designing a new type of real life testing potentially with the help from allied sciences, which becomes the subject of the next section.

3.4 CONTRIBUTIONS FROM ALLIED SCIENCES ON METHODOLOGICAL APPROACHES

As the so-called foundational elements reviewed in the previous sections come to light, it becomes clear that operationalizing and integrating them into an empirical research process could run into few challenges.

In this sense, learning from the theoretical approaches and empirical methods used in allied sciences might prove revelatory. It has been already signaled that great strides have been made in such social-sciences disciplines as development economics, environmental and ecological economics, innovation management, social ecology, history and political science in capturing both macro-level and longitudinal societal impacts (Wijen, 2023).

While there is a dense body of literature developed around such methodologies, the space the deals with the examination of long-term impacts and outcomes might give access to new tools borrowed from allied sciences. The main limitation in business research is that it tends to explore a relatively limited temporal expanse, often using cross-sectional data, and even when longitudinal approaches are employed, they tend to examine relatively short time frames. (Wijen, 2023). One such potential avenue refers to treatments that allow for temporalities in which impact mature so that is avoided an approach exclusively focused on short term. To this end, specific inter-disciplinary methods become a useful tool in this journey (i.e experimental or quasi experimental designs including natural experiments and clinical trials; historical longitudinal analyses to capture longer periods of impacts).

Although, the methodological aspect, the design of the research process might be viewed as not a real concern in a broader sense, in this specific case it can be argued as critical as it that deals with factors that are either difficult to operationalize (i.e integrative view) or might experience delays in output manifestation.

3.5 LINKING ALL FOUNDATIONAL ELEMENTS OF CORPORATE SUSTAINABILITY/SOCIAL IMPACT MEASUREMENT

The overview of the body of literature through this systematic review work has highlighted two dominant spaces: one that deals with specific anchors in the sustainability measurement (i.e., construct development, methodology or framework development or process integration in strategy) and a second space that deals with specific tension areas that are referenced hereby as foundational issues or missing links.

While it has been generated a rich body of knowledge for each specific foundational case, it has not been yet generated the connective tissue or the buildup in one integrated endeavor aiming to create a practical framework for incorporating it in the overall measurement process. However, the essential practical aspect is that the analysis of the future research questions though this exercise provides the needed red wire in designing a potential future research process. The additional cluster of foundational themes provides the anchor for each phase of a next empirical research.

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4. DISCUSSION AND CONCLUSSIONS

The results of this systematic review exercise show that the number of studies in field of sustainability measurement increased over years. Although there is a concentration in terms of publishing journals, the yearly number of papers is low (per author and per journal).

Top five journals (Sustainability, Journal of Cleaner Production, Journal of Business Ethics and Sustainability Accounting Management and Policy Journal) and top 4 authors (Chirico, Hansen, Hristov and Schaltegger) are a must read for any scholar developing the research in the sustainability measurement field and there is a rather wide space for new scholars to enter this field and further develop it, including doctoral researchers (as the fragmentation in terms of authors is extremely high with the first 4 authors leading with 2-3 works).

The results showed that a considerable number of studies were conceptual or qualitative, however most of the constructs in these studies have not been conceptualized through quantitative studies. There is a limited number of conceptual frameworks tested in empirical studies. A limited number of studies used quantitative analysis approaches.

It is concluded that there is a need for quantitative studies, so that results may be generalized to a wider population and their implications and benefits for practice may be registered.

One rather striking fact is that there had been limited progress in terms of integrating or building upon previous work. In the current study, it is discussed that there is a need for integration and a buildup on the findings to develop the much-needed connective tissue in this emerging field. We suggest that there is a need for collaboration between scholars in the field to help each other to enhance existing literature to be able to achieve the impact needed on operational level. Valuable knowledge has been created on distinct areas of sustainability measures yet there is a strong need for dialogue where the missing links have been identified.

One potential future research direction has been identified: developing an integrated approach aiming to synthesize the foundational requirements in the sustainability measurement endeavor.

As an additional point, from a methodological perspective and largely due to the complexity of the topic, embedding contributions from allied sciences may be useful to achieve more revelatory results.

As a final note, what stands out in this specific knowledge area is the need for extensive collaboration on multiple levels: between authors and contributors as signaled earlier and to a similar extent between various actors participating in different degrees and forms in what ultimately results in a validation following an empirical endeavor. This road-testing process it is an exercise transcending a specific industry and its relevant stakeholders in isolation as it is meant to truly follow the system thinking approach.

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