

Article

Challenges and How to Overcome Them in the Formulation and Implementation Process of a Sustainability Balanced Scorecard (SBSC)

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Abstract: To cope with the increasing importance of sustainability, the Sustainability Balanced Scorecard (SBSC) has been developed to support companies integrating the economic, social and environmental dimensions of sustainability into their business. However, the formulation and implementation process of an SBSC is confronted with multiple challenges that have to be dealt with. This article associates the challenges with four steps of the process in particular: (1) the conceptual integration of the three dimensions into the strategy, (2) the selection of the architecture of the SBSC, (3) the formulation of sustainable key performance indicators and the development of cause-effect chains, and (4) the implementation of the SBSC. For these steps, the article summarizes and outlines the identified challenges, discusses techniques, criteria, guidelines and success factors to overcome them and derives research gaps that need to be addressed. Hence, the article speaks to both researchers and practitioners. For researchers, the article's contribution is to synthesize the findings of the literature and to identify research gaps. For practitioners, the article's contribution is to provide a systematic process for companies to improve their sustainability management and performance.

Keywords: sustainability balanced scorecard; corporate sustainability; balanced scorecard; strategy formulation; strategy implementation



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1. Introduction

With global challenges such as climate change and rising poverty, both practitioners and researchers recognize the increasing importance of sustainability. Whilst 90% of executives in a broad range of industries acknowledge the relevance of corporate sustainability (CS), sustainability-related publications are accelerating [1]. In addition, a variety of stakeholder groups are increasingly demanding CS, putting companies under pressure from within as well as from outside to act sustainably [2]. As a result, CS has also become a competitive factor [3,4].

Corporate sustainability is a concept that, according to Linnenluecke and Griffiths [5], finds its origin in the broader concept of sustainability. In a nutshell, sustainability consists of three dimensions with equal importance [6,7]. The ecological dimension is primarily concerned with the preservation of the natural environment. The social dimension emphasizes the basic needs of human beings. The economic dimension focuses on the welfare of society.

The concept of CS aims to support companies to make progress in the spheres of all three dimensions of sustainability. Hereby, it is seen as insufficient to improve only one dimension of sustainability for corporate success [3]. Following the definition of Dyllick and Hockerts [8], CS means “meeting the needs of a firm’s direct and indirect stakeholders [. . .] without compromising its ability to meet the needs of future stakeholders as well” (p. 131). Hence, CS focuses on the long-term aspects of companies [3]. Linnenluecke and Griffiths [5] stress that CS requires visible organizational change (e.g., through sustainability measures and reports) and employees to adapt ethical values and responsibility. Although often used synonymously, CS has to be distinguished from corporate social responsibility

(CSR) as the latter focuses more on the social aspect of CS and is built on a stakeholder approach [3]. The question of how to adopt CS principles in practice is widely discussed. However, scholars frequently recommend the integration of a Sustainability Balanced Scorecard (SBSC). The SBSC is a promising tool that supports companies to integrate all three (i.e., the economic, social and environmental) dimensions of sustainability and remain competitive [3]. Ultimately, as Sands et al. [9] show, an SBSC has a significant positive impact on creating (customer) value and on the financial performance of a company.

Notwithstanding these promising opportunities, the formulation and implementation process of an SBSC is associated with multiple challenges, including the conceptual integration of the sustainability dimensions into the strategy, e.g., [10], the selection of the SBSC architecture, e.g., [11], the development of cause-effect chains and formulation of sustainable key performance indicators (KPIs), e.g., [12], and the involvement of employees when implementing the SBSC, e.g., [13]. In order to successfully apply an SBSC, each of these challenges has to be considered. Although the literature provides clues to particular aspects of the SBSC's formulation or implementation process, there is a lack of integrative approaches to successfully formulating and implementing an SBSC [14]. For example, Chaker et al. [15] criticize the fragmented literature especially with regard to the SBSC architecture design methodologies. The authors argue that the formulation of an SBSC often depends on subjective assessments as well as contextual inputs, and therefore call for a "revised and systematic SBSC construction methodology" [15] (p. 4221). Hristov et al. [10] emphasize the need to improve the overall implementation process of an SBSC, especially concerning the integration of social and environmental aspects. Moreover, Nikolaou and Tsalis [12] identify the lack of standard instructions on how to integrate sustainability into a BSC as a weakness, which in their opinion explains inferior sustainability performance results.

Against this background, the aim of this article is to systematize multiple approaches to integrate an SBSC into business. To this end, the article examines the following research questions (RQ) in particular:

RQ1: What are the challenges associated with the process of formulating and implementing an SBSC?

RQ2: How can the process of formulating and implementing an SBSC be improved in practice?

RQ3: Which research gaps need to be addressed to further improve the process of formulating and implementing an SBSC?

With these research questions, the article addresses both researchers and practitioners. For researchers, the article's contribution is to structure research by identifying the challenges discussed in the literature and how they can be overcome, thereby revealing research gaps such as selection criteria for the SBSC architecture. For practitioners, the article's contribution is to provide a systematic process for companies to improve their sustainability management as well as their sustainability performance. In particular, this article demonstrates the applicability of different framework concepts of sustainability management research at the interface of sustainability management and other disciplines of business administration such as controlling and strategy. For example, it is shown how the SWOT analysis and Quality Function Deployment (QFD) improve the formulation and implementation of the SBSC.

The methodology of the article can be described as theory synthesis, aiming at conceptual integration across multiple theoretical perspectives [16] in order to link and transform existing findings and theory [17]. The methodology of theory synthesis is to be distinguished from the methodology of the more inductive literature review. A literature review takes comprehensive stock of a field by integrating different research ideas and multiple research perspectives. In contrast, the methodology of theory synthesis allows the placing of a single conceptual theme at the center of analysis and the organization of existing knowledge according to this theme [16]. Such an approach fits the aim of this article, since it starts from the premise that the formulation and implementation of an SBSC is a specific process

whose individual steps are each associated with specific challenges. Thus, the article is based on an *ex ante* defined theoretical framework through which existing knowledge from multidisciplinary literature fields such as sustainability, strategy and controlling is organized. In this way, the article is able to identify the challenges of formulating and implementing an SBSC in a systematic way, and to reveal possibilities to improve the overall process. The methodology of theory synthesis is followed, e.g., by Hörisch et al. [18], who integrate knowledge of stakeholder theory and sustainability accounting, or Mihalic [19], who conceptualizes the phenomenon of overtourism.

The article is structured as follows. In the second chapter, the SBSC and its various architectures are introduced. The third chapter provides an overview of the challenges in the process of formulating and integrating an SBSC. Building on this, the fourth chapter then shows how these challenges may be addressed. In the fifth chapter, the article closes with a short conclusion, before the findings of this article are reflected and important implications for researchers, practitioners and policy makers are derived.

2. Theoretical Foundations of the SBSC

2.1. The BSC and the SBSC

The SBSC is a further development of the balanced scorecard (BSC). The BSC is a key performance indicator system developed to implement strategies [20]. It is based on the criticism that traditional KPIs are insufficient to assess economic performance. The BSC does not replace traditional KPIs, but complements them with non-financial measures such as employee qualifications and customer relationships that drive financial performance. The BSC's objective is to make these measures controllable and to understand their contribution to competitive advantages and long-term corporate success [21]. The BSC provides management with a balanced overall view of the company and is a tool for an indicator-based corporate management and controlling.

The traditional BSC addresses four perspectives [22,23]. The financial perspective represents the economic goals of the company. These goals are expressed in terms of profit-oriented KPIs such as cash flow or return on investment. The financial perspective constitutes a benchmark for the other perspectives. The customer perspective takes a closer look at how the company adds value to customers and looks at KPIs such as customer satisfaction and market share. The internal perspective focuses the (business) processes (e.g., production or sales process) and mostly uses process KPIs or innovation indicators. Finally, the learning and growth perspective considers employees' motivation and satisfaction as an essential part of a company's infrastructure to achieve its goals. The performance drivers of each perspective are linked to each other by cause-effect chains that are hierarchically aligned with the financial perspective and can only collectively ensure the company's success [23,24].

The SBSC builds on the BSC but puts particular emphasis on a company's sustainability strategy and on supporting managers to enhance their sustainability performance as well as the company's image. In contrast to a BSC, the SBSC recognizes sustainability-related objectives and performance indicators [25]. The SBSC integrates the three dimensions of sustainability for CS into a single management system [24]. It supports managers in determining the value of sustainability for the company [26] and is a tool for the integration of CS into strategic management [11]. Moreover, the SBSC aims to make CS measurable and allows a more accurate planning of sustainable management goals [12]. Hence, the SBSC helps to overcome the barrier between strategy formulation and strategy operationalization by breaking down the strategy into the perspectives of the traditional BSC [27].

2.2. The Integrative, the Extended and the Derived SBSC

The literature distinguishes different types of SBSC. The most commonly known types are the integrative SBSC, the extended SBSC and the derived SBSC [24].

The integrative SBSC integrates ecological and social objectives (and the measures connected to them) into the existing perspectives of a BSC. These objectives are incorporated into the cause-effect chains and are aligned top-down to the financial perspective.

The environmental and social aspects considered in the integrative variant thus generally have a market relevance and are reflected in the company's KPIs [24]. Considering three dimensions within four perspectives leads to twelve sub-goals at minimum in the integrative SBSC. Table 1 provides an exemplary overview of such sub-goals.

Table 1. The integrative SBSC, adapted from [28].

Sustainability Dimension	Financial Perspective	Customer Perspective	Internal Perspective	Learning and Growth Perspective
Economy	Return on Investment	Customer Satisfaction	Productivity	Innovation capability
Ecology	Investments in environmental protection	Recycling	Energy and resource efficiency	Eco-improvement suggestions
Social	Voluntary social benefits	Product safety	Improvement of working conditions	Qualifications

The extended SBSC expands the BSC to a fifth non-market perspective. In this way, the extended SBSC considers environmental and social aspects that are significant for business success but cannot be integrated within the four conventional perspectives. This fifth sustainability perspective includes environmental and social aspects that stand outside the usually considered cause-effect chains and are therefore not part of the market mechanism [24,29]. Non-market aspects can be socio-cultural, legal and political factors. For example, socio-cultural factors may refer to the social acceptance of business activities and therefore consider the relationship to the media, NGOs and trendsetters [30]. A current example concerning legal factors is the Supply Chain Law, which aims for compliance with human rights and environmental standards in global supply chains [31]. The strategic relevance of environmental or social aspects is often especially high in industries that are environmentally sensitive or highly exposed socially. The sustainability perspective is connected with the four perspectives of the traditional BSC. In this way, interconnections are considered and integrated into the cause-effect chains [24,29]. The extended SBSC is depicted in Figure 1.

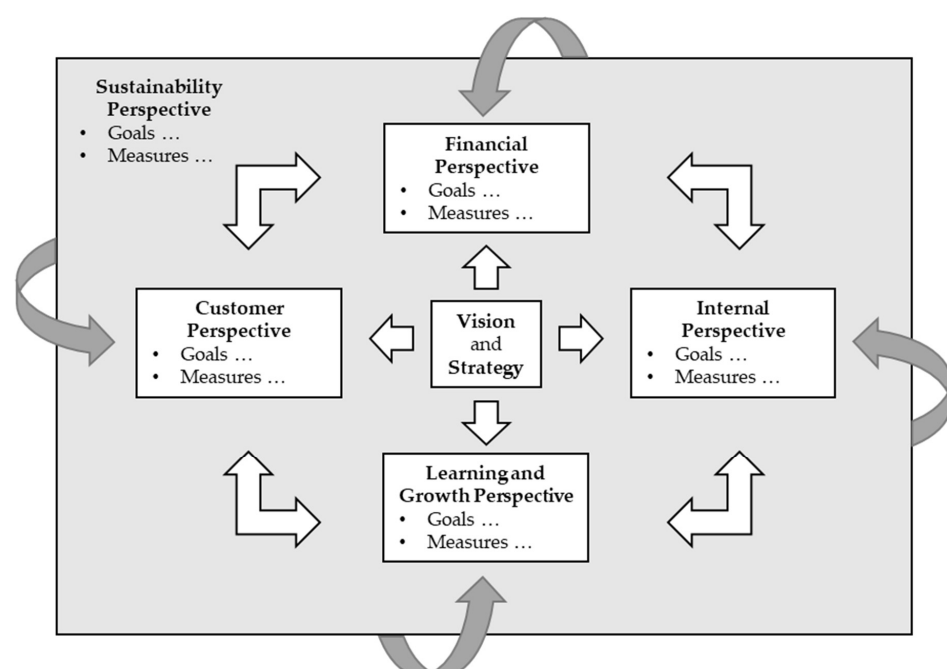


Figure 1. The extended SBSC, adapted from [27].

The derived SBSC is based on an existing, higher-level (S)BSC of a company and its contents. The aim of the derived SBSC is to add a stronger sustainability reference. It takes over the organizational and coordinative tasks of strategically particularly relevant environmental and social aspects and further differentiates them in the context of sustainability management [21,27]. The derived SBSC is open for the integration of different and new perspectives. According to Kalender and Vayvay [32], a sustainability perspective, a stakeholder perspective, a learning perspective or a process perspective, among others, are possible.

3. Challenges with Formulating and Implementing a Sustainable Strategy for SBSC

3.1. The Process of Formulating and Implementing an SBSC

Formulating and implementing an SBSC is a multi-staged process. From the literature, a total of seven tasks and thus steps in this process are identified, with the first six steps being part of the formulation (see Figure 2). Before analyzing the challenges in the respective steps, these must first be specified.

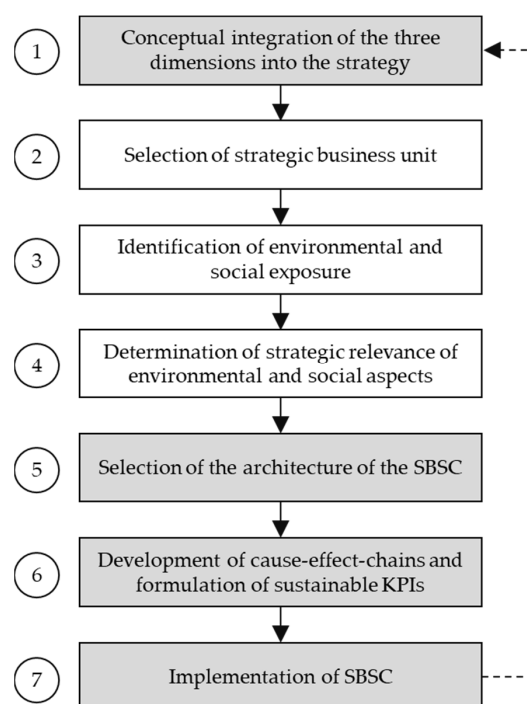


Figure 2. Process of formulating and implementing an SBSC, adapted from [24].

In general, a corporate strategy that takes into account all three dimensions of sustainability is a mandatory requirement for the implementation of an SBSC. Accordingly, the first step of the process is concerned with the integration of all three dimensions for building strategy with the SBSC. The formulation of the SBSC is not an independent process, but it is embedded in the overall strategy development process. Thus, the process starts with a general agreement on what the strategy is [24] and how the three dimensions of sustainability relate to the overall strategy. This includes a general agreement to consider environmental and social aspects in the strategy. The environmental and social aspects must be understood as genuine values and must not be reduced to an instrumental character (as a means to an end) [27].

The following steps correspond to Figge et al.'s [24] three-stage process of formulating an SBSC. The authors distinguish between the stages selection of strategic business unit (SBU) (step 2), identification of environmental and social exposure (step 3), and determination of the strategic relevance of the environmental and social aspects (step 4). Depending on the size of the company, the business unit level may be the same as the corporate level, but especially in large companies and groups, different business units often pursue

differing objectives. Subsequently, the environmental and social exposure of the SBU are determined. All the relevant environmental and social aspects to which the SBU is exposed have to be listed in order to get an overview of all the possibly strategically relevant social and environmental aspects. Figge et al. [27] therefore suggest frameworks that aid the identification of the environmental and social exposure of the strategic business unit. The following step is to determine the strategic relevance of the identified environmental and social aspects. To this end, Kaplan and Norton [33] propose to systematically examine the perspectives by following the hierarchy of a BSC. These aspects can be divided into strategic core issues that directly lead to KPIs, performance drivers that are necessary for achieving KPIs, or hygienic factors that have no strategic relevance but nevertheless cannot be ignored [27]. Since this distinction provides important clues about which architecture is suitable for implementation, the selection of the architecture is considered a separate stage of formulating an SBSC that follows on from the determination of the strategic relevance of environmental and social aspects; e.g., the strategic relevance has an impact on the decision as to whether an additional non-market perspective is necessary [24]. Moreover, the literature discusses the differences particularly of the extended and integrative SBSC and their advantages and disadvantages in order to derive implications on which architecture helps to improve the sustainability performance of a company, e.g., [11,34].

Following the selection of the architecture, the development of cause-effect chains and the formulation of sustainable KPIs as the sixth stage of the process is conceptualized. Although Figge et al. [24] view this task as an integral part of the determination of the strategic relevance of environmental and social aspects, a separate consideration of this task is suggested. Depending on the selection of the architecture, when developing the cause-effect chains, the environmental and social aspects have to be either integrated into the four traditional perspectives or be embedded into a fifth perspective. The cause-effect chains clarify for each perspective what contribution it makes to achieving the objectives of the overarching perspectives, thus ensuring that all strategically relevant aspects contribute to the successful implementation of the strategy [21]. In conjunction with this, KPIs are formulated to be able to control and steer the company's performance [24]. The KPIs are of high significance to how sustainability is measured [10,12]. Due to this relevance, the development of cause-effect chains and the formulation of sustainable KPIs are approached separately.

The final step is to implement the SBSC and put the strategy into action. For this, it is particularly important to engage the employees during the implementation process [14] and to communicate the sustainability performance to the stakeholders to satisfy their need for information [30]. Kaplan and Norton [35], moreover, state that the BSC can be utilized as a tool for organizational learning, hence deriving knowledge on how to modify strategies. Whilst gathering information and data, reflection about the performance measurements can be stimulated. As a result, impulses may emerge that initiate the process of formulation and implementation from the front and contribute to improvements [11]. Krstić et al. [36] argue that a strategy has to be periodically modified in order for companies to grow and achieve their sustainable development goals. Finally, Epstein and Wisner [25] mention payoffs from using an SBSC such as improved sustainability performance, increased employee satisfaction, decreased operational and administrative costs and an enhanced corporate image and reputation.

In the following sections, the challenges encountered in the described process of formulating and implementing an SBSC are elaborated on (for a summary see Table 2). In line with the literature, there are challenges associated with four steps of the process in particular: the conceptual integration of the three dimensions into the strategy (step 1), the selection of the architecture of the SBSC (step 5), the formulation of sustainable KPIs and development of cause-effect chains (step 6), and the implementation of the SBSC (step 7). In contrast, selecting a business unit (step 2) may be complex in larger companies, but it is not fraught with challenges specific to the scorecard. Moreover, scholars offer clear instructions on how to identify environmental and social exposure (step 3) and how to determine their strategic relevance (step 4), e.g., [21,27,30].

Table 2. Challenges with formulating and implementing a sustainability strategy for the SBSC.

Process Step	Challenge	Description	Sources
Conceptual integration of the three dimensions into the strategy	Addressing conflicting goals	There are conflicting goals between both the three dimensions of sustainability and different stakeholder groups that have to be addressed.	Epstein and Wisner [25]; Kaptein and Wempe [37]; Bieker [38]; Butler et al. [39]; Hahn and Figge [40]
	Understanding the contributions of the social and environmental dimensions to the company's financial performance	Companies need to link social or ecological management systems to general management and therefore have to understand their contribution to the economic success.	Epstein and Wisner [25]; Figge et al. [24]; Bieker [38]; León-Soriano et al. [41]; Tsalis et al. [14]; Hristov et al. [10]
	Formulating an actionable strategy	If a strategy is not linked to the goals as well as the resources of a company, it becomes a barrier to successful SBSC implementation.	Kaplan and Norton [22]; León-Soriano et al. [41]; Hristov et al. [10]
Selection of the architecture of the SBSC	Choosing between the integrative and extended SBSC	Since there is no consensus in the literature that either the integrative or the extended SBSC is generally superior, companies must choose the architecture that best fits their needs, characteristics and resources.	Epstein and Wisner [25]; Figge et al. [27]; Hahn and Wagner [21]; Figge et al. [24]; Hansen and Schaltegger [11]; Journeault [4]; Jassem et al. [42]; Jassem et al. [34]
	Deciding whether to add a derived scorecard or not	After the company has decided on either the integrative or the extended SBSC, it must be further decided whether the SBSC should be extended by a derived SBSC.	Figge et al. [27]; Hahn and Wagner [21]; Figge et al. [24]; Journeault [4]; Kalender and Vayvay [32]
Development of cause-effect chains and formulation of sustainable KPIs	Identifying cause-effect chains and connecting them with KPIs	The identification of the cause-effect chains and their connection with KPIs is a highly unstructured process fraught with the risks of reality distortions and lack of implementability.	Kaufmann and Becker [43]; Chaker et al. [15]; Chaker et al. [44]; Hahn and Figge [40]; Hansen and Schaltegger [45]
	Aligning KPIs with the company's strategy	Even though KPIs may be easily controllable and measurable, they may not reflect the company's strategy in a sufficient way.	Kaplan and Norton [22]; Schneiderman [46]; Möller and Schaltegger [47]; Kaufmann and Becker [43]; Schaltegger and Lüdeke-Freund [30]; Nikolaou and Tsalis [12]; Tsalis et al. [14]; Sattler and Wange [48]; Qorri et al. [49]; Hristov et al. [10]
Implementation of SBSC	Involving employees to ensure commitment and to reduce mistrust	The implementation of the SBSC may cause distrust and resistance to change, which is why employees need to get involved and accept the instrument.	Bieker [38]; Kaufmann and Becker [43]; Rompho [50]; Nikolaou and Tsalis [12]; Tsalis et al. [14]; Falle et al. [51]; Hristov et al. [10]
	Communicating the sustainability performance with key stakeholders	The SBSC needs to be connected to the sustainability reporting of a company and satisfy the stakeholder's diverse need for information.	Bieker [12]; Schaltegger and Lüdeke-Freund [30]; Journeault [4]
	Enhancing organizational learning and development	The BSC provides feedback about the strategy that needs to be integrated in the processes of organizational learning in order to continuously adapt the strategy.	Kaplan and Norton [33]; Epstein and Wisner [25]; Kaplan and Norton [35]; Hansen and Schaltegger [11]

3.2. Conceptual Integration of the Three Dimensions into the Strategy

A strategy that integrates all three dimensions of sustainability is a necessary precondition for the successful implementation of an SBSC [27]. A strategy comprises the long-term goals of an organization as well as the resources and plans necessary to achieve both these goals and competitive advantages [52]. However, formulating a sustainable strategy is confronted with multiple challenges that need to be addressed.

The first challenge refers to conflicts or trade-offs between the three dimensions of sustainability and/or different stakeholder groups. Regarding the latter, companies need to integrate heterogeneous and competing logics [40]. Moreover, sustainable practices may require investments or result in higher costs, leading to a trade-off between the improved ecological performance and a company's profitability. As long as managers are unable to demonstrate how sustainable practices lead to increased revenues, they are difficult to justify [39]. Accordingly, limited budgets tend to conflict with innovations that require investment [38]. In addition, Kaptein and Wempe [37] mention corporate ethical dilemmas such as trade-offs between job security or layoffs to protect the business, globalization versus local responsibilities and opportunities to operate in politically sensitive regions versus support for human rights. Furthermore, Hahn and Figge [40] summarize key characteristics of CS that address economic, environmental and social issues that aim for economic development and climate change or poverty alleviation. These issues are connected to each other and are internally interdependent. Due to the interrelatedness of the subjects, addressing one issue might lead to the deterioration of another. Thus, CS deals with paradoxes, contradictions, tensions and competing logics that companies have to manage.

The second challenge is to approach all three dimensions of sustainability in an integrative manner, to understand the contribution of the social and environmental dimensions to the company's financial performance [14,24,25,38,41,53]. Often, companies implement social or ecologic management systems in order to address the growing importance of social and ecologic issues, but fail to connect these systems to the general management of the firm. Consequently, the contribution of the social and ecological issues to the financial performance cannot be identified. Therefore, the economic, social and ecological dimensions of sustainability need to be considered equally during the formulation of a sustainable strategy as a precondition for the SBSC.

The third challenge is to formulate a strategy that is actionable. The SBSC is a tool to translate strategies into action in order to enhance their successful execution in terms of the three dimensions of sustainability. Hence, if a strategy is not linked to the goals as well as the resources of a company, it becomes a barrier to a successful SBSC implementation [10,22]. Consequently, León-Soriano et al. [41] state that the definition of an appropriate sustainable strategy within a strategic planning process is of great significance for an SBSC to succeed. As a result, companies need to analyze their capabilities and resources and take them into consideration for a successful strategy implementation via SBSC.

3.3. Selection of the Architecture of the SBSC

The fifth step of the formulation and implementation process deals with the selection of the architecture of an SBSC. In the literature, there are different suggestions on how to integrate sustainability into the SBSC, leading to different SBSC architectures. Thus, the question of which architecture of an SBSC has the most potential to lead to CS represents a key question both in research and practice.

In general, there is an ongoing debate in research as to whether an additional perspective or integration into the traditional perspectives should be used to address sustainability objectives. However, there is no consensus to date on which of the architectures is superior to the other [4,11,34]. Companies are accordingly faced with the challenges of selecting the architecture that best meets their requirements. As Jassem et al. [42] argue, this presupposes the sufficient knowledge of managers on SBSC architectures. An insufficient understanding of the SBSC can have a negative impact on decision making and may also lead to an inadequate use of the SBSC. Epstein and Wisner [25] further emphasize that the choice of architecture is dependent upon the challenges an organization faces; e.g., aspects such as stakeholder pressures and available

human resources are important factors when selecting an architecture. In sum, the selection of architecture is organization-specific and dependent on its sustainability strategy [11].

In this article, choosing between an integrative and extended SBSC is considered as the first and foremost challenge due to their dominance in the literature [34]. The second challenge to be dealt with afterwards is the decision as to whether a derived SBSC should be added or not.

3.4. Development of Cause-Effect Chains and Formulation of Sustainable KPIs

The sixth step of the process of formulating and implementing an SBSC is concerned with the development of cause-effect chains and the formulation of sustainable KPIs. The main task is to align strategically relevant aspects in cause-effect chains and to select quantitative and qualitative indicators that control and steer the company towards the achievement of its sustainable goals [24]. The outcome of this step in the process is crucial for the success of the subsequent implementation as well as the identification of chains from the lowest to the highest level [43]. Two main challenges are identified in this regard.

The first challenge lies in the identification of the cause-effect chains and their connection with KPIs. As the SBSC is conceptually limited to linear cause-and-effect chains [40], the interdependencies between and within the three dimensions of sustainability must be broken down in a way that is both controllable and reflective of reality [45]. This process is highly unstructured and often based on managers' intuition. This is not necessarily inferior, as intuition taps into managers' tacit knowledge and provides a holistic view of these interdependencies [54]. However, this requires sufficient experience with the SBSC and the company in which it is to be implemented [43]. Even then, the manager's intuition and the mental models embedded in the company's context may lead to biases through which the identified chains and KPIs only inadequately reflect reality [15]. Unfortunately, there are no standard instructions for the identification of the cause-effect chains and the integration of sustainability concerns into KPIs [12,14,46,55]. Nevertheless, due to the high context specificity and ambiguity of this task, it is questionable to what extent these would not oversimplify reality and thus lead to biases.

The second challenge refers to the risk that KPIs do not reflect the company's strategy. Sustainability-oriented KPIs condense quantifiable information, present it in a clear and concise manner, and make interrelationships recognizable. As a result, developments and deviations from strategic plans are quickly identified and serve as a basis for taking strategic measures [48]. However, there are several reasons why KPIs might not reflect the company's strategy. One reason for this is that the SBSC incorporates the goals of an organization in a very aggregated way. Kaplan and Norton [22] state that any BSC should not include more than twenty to twenty-five indicators, since it is difficult to observe more than five goals per perspective. Moreover, qualitative and quantitative KPIs need to be balanced in the right way [10]. It is thus not sufficient to add qualitative indicators to financial indicators since this is "a dilution of effort" [46] (p. 7) and does not contribute to the balance of qualitative and quantitative indicators. In contrast to purely economic KPIs, it is difficult to collect new data in an SBSC in order to establish cause-effect chains between a company's resources and capabilities as well as sustainability aspects and financial results [47,48]. Furthermore, quantifying social KPIs itself cannot be based on quantitative measurements and requires subjective interpretation and selection, potentially leading to misperceptions [49]. As Schneiderman [46] points out, the conflicting requirements of stakeholders such as customers, suppliers, employees and future generations may be a further cause for determining KPIs that do not reflect the strategy in a sufficient way, see also [30].

3.5. Implementation of SBSC

After the formulation of the SBSC is completed, the final step is its implementation. This step encompasses putting the strategy into action, communicating the company's sustainability performance to the stakeholders, and monitoring it for continuous improvement and organizational learning. Each of these aspects is accompanied by specific challenges.

First, the successful implementation of an SBSC (like any strategy-related implementation) requires the support and commitment of employees who are supposed to gather, analyze and evaluate the relevant data. Limited (human) resources and lack of acceptance are seen as a significant barrier to successful (S)BSC implementation [10,50]. For the SBSC, Falle et al. [51] emphasize high employee involvement as a key factor for success. Nevertheless, employees often meet an SBSC with mistrust due to the time-consuming process and the required effort to implement an SBSC [12,14], whereby missing guidelines and a lack of knowhow to facilitate SBSC development may further strengthen this influence. Mistrust may also arise if employees are not given the chance to understand the value of the SBSC, as they might conclude that its purpose is to control their efficiency [43]. Implementation is further associated with organizational change, so employees may be generally rejecting it due to the uncertainty it creates [56]. In particular, the introduction of social and environmental goals may lead to confusion among employees when they are used to aligning their work exclusively with economic goals [12,51]. As a result, following a strict top-down approach when implementing an SBSC without considering the employees and their concerns is likely to cause internal resistance [38]. As, in addition, employee satisfaction itself is an important part of the internal perspective and the social dimension of sustainability, supporting employees to overcome their skepticism and distrust towards the SBSC as well as their resistance to change while implementing an SBSC must be taken into account as a key challenge.

Second, a fundamental part of sustainability performance is stakeholder management. Journeault [4] emphasizes that companies that do not take sufficient care of their multiple stakeholders when implementing the SBSC potentially jeopardize their reputation and market capitalization, and ultimately reduce their shareholder value. It is thus important to communicate the sustainability performance with the stakeholders it addresses [57]. The SBSC needs to be connected to the sustainability reporting of a company and satisfy the stakeholder's diverse need for information [30]. Due to the different, possibly contradictory expectations, this is a challenging endeavor. Communication to stakeholders must not only be in line with their expectations, but must also be consistent as a whole; otherwise, the impression of practicing cheap talk may be created.

Third, organizational learning and the continuous adaption of strategies are fundamental to speak of a sustainable strategy that is successfully implemented. According to Kaplan and Norton [33], the BSC provides feedback about the strategy and enables managers to adjust the implementation of their strategies and make changes to the strategy itself. Managers are confronted with the task of generating impulses for the continuous improvement of the company's strategy. Therefore, they need to stimulate and enable discussions on how to further develop the SBSC [11,35]. Kaplan and Norton [33] further argue that "[o]rganizations need the capacity for double-loop learning" (p. 20). This allows the SBSC to improve the sustainability performance of a company and thus to increase employee satisfaction and market opportunities [25].

4. Improving the Process of Formulating and Implementing an SBSC

4.1. Techniques for Developing a Sustainable Strategy

For the challenges encountered in the process outlined above, the literature discusses various techniques and approaches that can be used in each step to overcome the challenges. On the one hand, the reflections in this article on these techniques, criteria, guidelines and success factors systematize the research on how to overcome challenges with formulating and implementing an SBSC, but on the other hand, they also offer a structured procedure for practitioners to successfully navigate this process (although it is not the intention of this article to explain the execution of the techniques in a step-by-step manner). Starting with the analysis of the first process step, developing a sustainable strategy is focused first.

In order to integrate all three dimensions of sustainability into the strategy, the literature proposes two techniques: (Sustainability) SWOT analysis and QFD. In particular, SWOT analysis and (S)BSC are associated with each other in the context of strategic planning [14,58–64]. However, as Shields and Shelleman [65] point out, the sustainability SWOT

is not the entirety of a strategic planning process and should not be viewed in isolation. Following Ip and Koo [59], complementing sustainability SWOT analysis with QFD provides a pragmatic approach to strategic planning. Both approaches in terms of their potential to address the associated challenges are now discussed.

A SWOT analysis provides the foundation for strategy formulation. This technique helps to identify the situation at hand and systematically analyzes the internal strengths and weaknesses of an organization and the external opportunities and threats it faces to derive promising future strategies [63]. In the context of sustainability, a SWOT analysis aims to identify sustainability-related opportunities that companies can seize and threats they have to deflect in order to gain competitive advantages. The internal capabilities have to fit the actions necessary to address these key strategic issues [65,66]. Fresner et al. [60] see SWOT analysis as an integral part of the design process of an SBSC, which builds on the vision of the company. They, moreover, recommend involving different stakeholders such as important partners and employees in the process of conducting a SWOT analysis in order to exploit the creative potential of the company.

The SWOT analysis addresses all the three identified challenges for developing a sustainable strategy. To illustrate this, Figure 3 shows an exemplary sustainable SWOT analysis of potentially relevant sustainability issues. First, a SWOT analysis is able to address conflicting goals. In this exemplary sustainable SWOT analysis, the Supply Chain Act offers the opportunity to improve social and environmental conditions in global supply chains, while at the same time the act poses an economic threat especially due to higher costs and the monitoring of supply chains [31]. Second, a sustainable SWOT analysis is able to identify the strengths, weaknesses, opportunities and threats for all the dimensions of sustainability, e.g., managers may use a SWOT analysis as a method to brainstorm to identify sustainability-related capabilities [66]. In combination with other external and internal aspects, all the dimensions of sustainability are considered in an integrative manner. In addition, the threats identified in our exemplary SWOT analysis can be linked to different dimensions of sustainability. Third, a sustainable SWOT analysis ensures that a strategy is actionable by examining the internal capabilities of a company. For instance, a company that aims to exploit the opportunity of increasing demand and greater willingness to pay for sustainable products and services needs sufficient knowledge about sustainable customer preferences to take advantage of this opportunity [65].

<div>Internal</div> <div>External</div>	Strengths: <ul style="list-style-type: none"> • Commitment to sustainability • Knowledge about sustainable customer preferences • Motivated employees 	Weaknesses: <ul style="list-style-type: none"> • Lack of knowledge and understanding of sustainability • Dependence on non-sustainable processes and suppliers
	Opportunities: <ul style="list-style-type: none"> • Increasing demand for and greater willingness to pay for sustainable products and services • Recruitment of motivated and qualified employees • Improved social and environmental conditions in global supply chains (Supply Chain Law) 	SO-strategy: <ul style="list-style-type: none"> • Use sustainability knowledge and sustainable supply chains to satisfy increasing demand for sustainability, generate profits, and retain as well as recruit motivated and qualified employees
	Threats: <ul style="list-style-type: none"> • High level of regulation (e.g. Supply Chain Law) • Climate change • Resource scarcity • Increase in prices • Conflicts with stakeholders 	WT-strategy: <ul style="list-style-type: none"> • Develop new processes and attract new suppliers to maintain regulatory compliance, avoid sanctions and improve stakeholder relationships

Figure 3. A sustainable SWOT analysis, adapted from [31,65,67].

Compared to sustainability SWOT analysis, QFD takes a different approach. In general, QFD aims to provide “a means of translating customer requirements into the appropriate technical requirements for each stage of product development and production (i.e., marketing strategies, planning, product design and engineering, prototype evaluation, production process development, production, sales)”, as cited in [68,69] (p. 463). Thus, the starting point of this technique is to understand customers’ requirements and deploying their expectations throughout the entire process of product development [62,69]. A central element in QFD is the so-called House of Quality (HOQ). It is composed of the “What’s” representing the customers’ requirements and needs, and the “How’s” which define how to meet these needs [63]. The “What’s” and “How’s” are usually technical measures of the proposed product.

Quality Function Deployment is a suitable tool to include sustainability requirements throughout the entire process. The relevant criteria in the HOQ can be derived from the principles of eco-design and also from health and safety issues. The goal is to increase the benefit of the product while reducing its environmental impact [70]. Furthermore, QFD improves the BSC formulation process in general as it helps to find linkages between the perspectives of a BSC [71] and to develop the cause-effect chains [59,62]. As part of the QFD, the management team is supposed to subjectively and collectively conceptualize the cause-effect chains in a democratic manner and to clarify potential discrepancies. Thus, the technique helps to systematically capture the three dimensions and to consider the interests of multiple stakeholders through different perspectives. As Schneiderman [46] outlines, QFD is effective in balancing conflicting stakeholder interests because the technique identifies and prioritizes stakeholder requirements, ranks the processes that impact those requirements, and establishes metrics for those processes. In summary, QFD addresses all the identified challenges with conceptual integration of the three dimensions of sustainability into the strategy: QFD (1) balances conflicting stakeholder interests, (2) integrates each dimension of sustainability by aiming to increase benefits while reducing environmental impact, and (3) ensures an actionable strategy by identifying the “How’s”.

The complementarity of the sustainability SWOT analysis and QFD is evident in their synergies regarding the SBSC [62]. The sustainability SWOT analysis serves as the foundation for strategy formulation; knowledge about customer preferences contributes to the strengths of a company. Beyond that, the use of SWOT analysis and QFD also serve as a good foundation for the later stages of the formulation and implementation process; e.g., the HOQ helps to develop the cause-effect chains in an SBSC, which also translates and communicates the strategy for the employees.

4.2. Criteria for the Selection of a Suitable Architecture

As argued, the selection of the architecture is by no means trivial and is associated with specific challenges. To structure this task, the outlined process framework conceptualizes it as a two-step decision-making process. The first decision to be made is the selection between the integrative and extended SBSC. The second decision is whether to add a derived SBSC or not in each case. For both decisions, the criteria are now discussed to support the selection of a suitable alternative.

For the selection between the integrative and extended SBSC, two decision-relevant criteria in particular are derived from the literature: (1) the determination of the strategic relevance of environmental and social aspects, and (2) the relevance of market and non-market factors. Regarding the former, both Figge et al. [27] and Journeault [4] recommend selecting the extended SBSC in cases where the environmental and social aspects are strategic core issues or performance drivers. They argue that adding a fifth perspective ensures that both management and employees pay sufficient attention to the environmental and social dimension of sustainability and highlights their significance, see also [29,32,39]. Figge et al. [24] specifically state that only strategic core aspects justify a fifth perspective. However, it should not go unmentioned at this point that Arnold et al. [28] emphasize that ecological and social performance drivers are also integrated into the integrative SBSC. In

contrast, when environmental and social aspects are identified as hygienic factors with minor strategic relevance, they can be more easily integrated into the four perspectives of an integrative SBSC. In this way, environmental and social aspects can be fully integrated within the activities of the organization, whereby the risk that these aspects run in parallel with other processes and key elements of the firm is reduced [4]. Thus, in line with Figge et al. [27], selecting the integrative SBSC in this case is recommended.

In terms of the relevance of market and non-market factors, Schaltegger [29] proposes that a high market relevance of environmental and social aspects indicates one should select an integrative SBSC. To strengthen his argument, he gives the example of resource and energy efficiency as performance drivers of process cost targets. The resource and energy efficiency add an ecological aspect to the internal perspective. Butler et al. [39] emphasize that integrating sustainability measures into the four conventional perspectives is beneficial to a company's financial performance because they are seen as fundamental to day-to-day operations. In contrast, Figge et al. [24] argue that adding a perspective is necessary when non-market aspects cannot be reflected within the traditional perspectives. In addition, there are general points of criticism with regard to the consideration of market and non-market factors that must be taken into account in the selection process; e.g., Journeault [4] criticizes the general neglect of non-market aspects within the integrative SBSC. He argues that the alignment of the ecological and social dimension with the economic dimension of sustainability leads to a disregard of dependencies and interactions with non-market aspects. In cases where the integrative SBSC is selected, this risk of neglect should be addressed accordingly. This applies analogously to the reverse case; i.e., when using the extended SBSC, it should be ensured that the potential market relevance of aspects is monitored.

Subsequent to the selection of either the integrative or the extended SBSC architecture, managers have to decide whether they want to add a derived scorecard. There are two decision-relevant criteria in this respect as well that match with those identified for the first architectural decision. First, in the case of companies whose strategic core issues and performance drivers mainly consist of environmental and social aspects, the usefulness of a derived SBSC is seen as high because it provides greater clarity on the role of a company's environmental and social aspects and allows for a more comprehensive controlling of strategically relevant environmental and social aspects [4,27,29]. Second, since the derived SBSC focuses on environmental and social aspects, it is suitable for differentiating these aspects, especially if they have a high non-market relevance. Because the derived variant primarily highlights environmental and social aspects and does not consider the financial value, its significance for market aspects is rather low [4]. Remarkably, at this point, if considering the criteria for both architectural decisions together, an extended SBSC seems to be advantageous exactly when a derived SBSC appears to be advantageous as well. Since this connection has not been discussed in the literature so far, further research is suggested to add substance to the question of whether and to what extent this connection exists. Another point that has to be taken into account is the effort to implement and control a derived SBSC. Usually, the introduction of a derived SBSC requires establishing and integrating environmental and/or social departments into the organization. This may be of particular relevance for SMEs with limited resources [72].

Although one is able to identify criteria for assessing the advantageousness of different architectures, it is important to emphasize that giving recommendations in this respect remains a difficult and complex endeavor. Several authors [35,42,73] argue that a lack of SBSC-type knowledge causes an insufficient use of the SBSC. They propose a conceptual model [34] in which, in addition to the mediating role of SBSC knowledge, an expert moderates the environmental performance outcome. The adequate selection of the architecture presupposes sufficient knowledge of its specifics and the internal and external conditions of the company.

4.3. Guidelines for the Development of Cause-Effect Chains and the Formulation of Sustainable KPIs

As described, cause-effect chains often are and in part need to be based on a manager's intuition, contextual knowledge and subjective experiences. Thus, it is difficult to develop them objectively. As outlined above, however, the SWOT analysis along with QFD and its central HOQ provides a solid foundation for the development of cause-effect chains. Koo and Koo [61] argue that "QFD enables a succinct way of depicting the relationship among the internal factors" (p. 73). Moreover, Figge et al. [24] recommend going through the perspectives in a cascade-like process, starting with the financial perspective, to identify cause-effect chains. They argue that this process ensures the causal linkage of all strategically relevant aspects as well as the hierarchical alignment to the financial perspective. According to Bieker [38], the visualization of the cause-effect chains additionally helps to understand the interconnectedness of strategic goals. Nonetheless, since Chaker et al. [15] identify biases in the development of cause-effect chains as a cause for failing SBSCs, further research for a more systematic and objective approach for the development of cause-effect chains is necessary.

Although the subsequent formulation of KPIs is in part an unstructured process as well, the literature on sustainability reporting provides several guidelines. The most widely recommended guidelines stem from the Global Reporting Initiative (GRI), ISO norms and the Eco-Management and Audit Scheme (EMAS). The GRI is a reporting framework that is voluntary but accepted to guide organizations to sustainability. It addresses global key issues and aids companies in reporting their sustainable achievements, which in turn raises awareness and promotes business accountability. Due to standardizations, companies can also set benchmarks and compare their results [74]. Hence, for SBSC implementation, several scholars recommend basing the formulation of KPIs on GRI [39,74,75]. According to Medel et al. [74], the SBSC and GRI are complementary frameworks for the inclusion of all three dimensions of sustainability into general management. In tandem, both frameworks have the potential to improve strategy management and sustainability reporting and thus help to ensure effective stakeholder communication.

The ISO norms and EMAS offer further guidance for selecting sustainable KPIs with the overarching goal of sustainability reporting, e.g., [6,14,38]. The Eco-Management and Audit Scheme is a voluntary management instrument provided by the European Commission to help organizations evaluate, report and improve their ecologic performance. It aims to reduce costs, increase sales opportunities and confirm compliance with ecological standards [76]. Measures especially for the ecological dimension of sustainability can be derived from these environmental management systems [77]. Dias-Sardinha et al. [55] found that companies with an environmental management system seem more likely to practice pollution prevention. Dal-Bianco [78] further suggests combining the SBSC with ISO 26000, which is an international guideline for social responsibility. The seven areas of action of the ISO standard provide orientation for the formulation of KPIs and consider various stakeholders.

Conclusively, GRI, EMAS and ISO standards address the challenge of integrating sustainability concerns into KPIs by offering guidelines and orientation on how to select sustainability indicators to reflect their sustainable strategies. These guidelines take the various stakeholders' needs into consideration and turn the delivery of high-quality information into a basic principle [39]. However, formulating KPIs is a part of the relatively new field of sustainability controlling which has not been fully researched yet. With regard to the identified challenges, further research to focus on finding a balance between qualitative and quantitative KPIs in the particular context of an SBSC is needed.

For illustrative purposes, exemplary sustainability goals and KPIs are summarized in Figure 4. These are based on the study of Hristov and Chirico [53] who compiled sustainable and practical relevant metrics. Apart from that, however, the authors argue that KPIs are dependent on the companies and their individual goals. All formal guidelines should therefore only be seen as an orientation to be applied by management in a context-specific manner.

		goals	key performance indicators
dimension	ecologic	reduction of emissions	emission of greenhouse gases rate carbon footprint rate
		reduction of natural resource consumption	energy intensity, electricity consumption, water use rate, gas consumption rate
	social	employees' acceptance of organizational change	employee satisfaction rate, employee turnover rate, number of training hours per employee, support employee rate (health care, physical activity)
		to guarantee the respect of the human rights	equality rate, child labor rate, number of disciplinary actions, social security rate
	economic	to increase return of investment	cost of ownership linked to: energy, cost consumption and environmental tax, environmental cost savings, amount of environmental penalties
		to increase the revenues associated to sustainability dimensions	sustainable innovations rate, % of additional revenue, % of income from recycling/close loop programs

Figure 4. Sustainable KPIs, adapted from [53].

4.4. Building Blocks of a Successful Implementation of an SBSC

For the challenges outlined during the implementation of an SBSC with particular regard to the employees of a company, the literature gives diverse recommendations that are briefly summarized in this section.

The literature strongly agrees employees need to be engaged in the (S)BSC implementation process. In this regard, Bieker [57] argues that combining top-down and bottom-up approaches enhances the acceptance of the SBSC and the company's strategic goals. To promote the concept of sustainability in the entire organization, Gminder et al. [13] additionally propose involving all levels of employees from the beginning and discussing the planned implementation with them. Schneiderman [46] emphasizes disaggregating and deploying the goals of the SBSC downward in order for each employee to understand their contribution to the company's success. In many respects, middle and lower management possess better company-specific knowledge and may help to define adequate objectives and measures on these levels. For the definition of tasks, timelines and resources, scholars also suggest creating a project team of experts from different departments [41,51]. Kaplan and Norton [35] further stress the role of leaders in communicating the vision and strategy of the SBSC and creating a climate of change. Moreover, team leaders could organize workshops to develop a team vision and to identify the strategic objectives for a team. These may then be translated into a team scorecard or further cascaded to individual scorecards [78]. As Falle et al. [51] emphasize, workshops involving brainstorming and discussion methods in combination with the support of the top management are key factors for successful SBSC implementation. Additionally, leaders need to ensure that the necessary resources are available and that employees receive the training they need whilst boosting morale and helping collaborative efforts.

The strategy development techniques mentioned can also be used beneficially in implementation. According to Koo and Koo [61], QFD is an effective technique in making the employees' contributions to the achievement of the company's goals transparent. Analogously, Fresner et al. [60] recognize the value of SWOT analysis in involving employees and helping them to utilize their creative potential and deploy it within the implementation process. Yemeshvary Ashok Upadhyay and Palo [79] summarize that using the BSC to engage employees leads to increased efficiency, customer satisfaction and lower turnover rates. Conclusively, the use of these techniques helps employees to understand the big picture, to find meaning in their job, to contribute innovative ideas and to share their knowledge for the company's success.

The second challenge concerns the stakeholder management within an SBSC. Schaltegger and Lüdeke-Freund [30] describe the general necessity to connect the SBSC to the sustainability reporting of a company. To this end, the SBSC needs to be connected to the

sustainability reporting of a company and to satisfy the stakeholders' diverse need for information. Sustainability accounting then links sustainability reporting and the SBSC. The latter specifies the information needed, and sustainability accounting collects and analyzes it. Through sustainability reporting, performance is finally communicated to the stakeholders. Furthermore, Medel et al. [74] recommend using the SBSC and GRI as complementary frameworks for effective stakeholder communication. Unfortunately, apart from connecting the SBSC to sustainability reporting, little is known about how to incorporate stakeholder management into the SBSC [4].

The third challenge concerns organizational learning and the further development of an SBSC. Kaplan and Norton [22] argue that double-loop learning is necessary to derive strategic learnings from the (S)BSC. They stress that managers need to "question their underlying assumptions and reflect about whether the theory under which they have been operating is still consistent with current evidence, observations, and experience" [33] (p. 20). Moreover, the development of a system for strategic feedback is needed through which deviations become transparent and can be considered. As Massingham et al. [80] point out, in order to facilitate organizational learning, employees need to receive appropriate training, e.g., on best practices, and they have to be supported and motivated to share their knowledge so that best practices can become ingrained in the company. In cases where employees do not have the necessary skills and resources, appropriate human capital must be acquired, or new partnerships have to be formed. Overall, this point is about establishing a culture of learning to exploit the (S)BSC's potential for strategic learning and to set new cycles of (re)formulating and (re)implementing the SBSC in motion.

5. Conclusions

The aim of this article was to structure research by identifying the challenges with formulating and implementing a sustainable strategy for the SBSC and discussing ways to overcome these challenges. To this end, the article identified and outlined these challenges regarding the conceptual integration of the sustainability dimensions into the strategy, the selection of the architecture, the development of cause-effect chains and the formulation of sustainable KPIs, and their subsequent implementation. For the purpose of conceptual integration, the research on each process step was synthesized and integrated into an overarching process of SBSC formulation and implementation.

In particular, SWOT analysis and QFD are seen as suitable techniques for the integration of the three dimensions of sustainability into the strategy and for addressing the related challenges. Several criteria to support the selection of an appropriate architecture are identified, and this decision should be complemented by sufficient knowledge of the SBSC and the internal and external conditions of the company. It has become apparent that SWOT analysis and QFD also serve as a solid foundation for the development of cause-effect chains, and that GRI, EMAS and ISO norms are suitable guidelines for the formulation of sustainable KPIs. The significance of the employee's engagement during the implementation of an SBSC is pointed out and suggestions are made of how to manage stakeholder communication and foster organizational learning in that stage.

In order to further highlight the resulting need for future research and the practical benefits gained from the findings, the article's implications for research and practice will be addressed separately in the final section.

6. Implications for Research and Practice

6.1. Implications for Researchers

Several research implications emerge from the analysis of the techniques and approaches to manage the process of formulating and implementing an SBSC. To begin with, the process of developing cause-effect chains and formulating sustainable KPIs needs to be looked at more closely in two ways. On the one hand, a more systematic approach is needed to reduce bias from managers' intuition and dominant mental models. In this respect, Chaker et al. [15] call for research to improve the development of the cause-effect

chains and point to the need for a systematic and objective approach in this regard. Moreover, the literature lacks clear recommendations on how to formulate sustainability KPIs for an SBSC, e.g., [14]. Mostly, the literature generally recommends following guidelines such as the GRI, ISO standards and EMAS when formulating key figures, e.g., [12,39,73], but there is to the best of our knowledge no SBSC-specific research when it comes to formulating KPIs (e.g., with regard to the balance between quantitative and qualitative KPIs within an SBSC). On the other hand, as outlined earlier, the process of developing cause-effect chains and formulating KPIs is highly context-specific and cannot be formalized completely. Intuition, tacit knowledge and mental models are thus not only barriers but also enablers of this process. 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, see also [40]. From this perspective, cause-effect chains and KPIs are the result of numerous interactive micro-activities embedded in a social context, rather than something strictly planned on a drawing board [80]. Such research could help to better understand these processes and identify potential areas for improvement without overly formalizing them.

Furthermore, the selection of the right architecture is another future issue to be further explored. Although this issue has already received attention in the literature, there still are research gaps that need to be addressed. First, based on the findings in this article, there is potential in the investigation of the relation of the derived SBSC to both the extended and the integrative SBSC. There is a consensus that the derived SBSC should not stand in isolation, but should either build on the integrative or the extended SBSC, e.g., [4,21,27,29]. As the analysis suggests that the derived SBSC is particularly suitable when an extended SBSC also appears advantageous, further research should take a closer look at this connection. Second, the question of under which conditions one should select which SBSC architecture still remains partly unresolved. Hahn and Figge [40] even question whether an SBSC is at all suitable for achieving sustainability goals. They argue that an SBSC is unfit to adequately address CS and achieve transformational change; for a critical response, see [45]. This notwithstanding, the current state of research does not allow one to make clear recommendations about the selection of architecture. Third, based on the findings in this article, knowledge about SBSC architectures is advantageous in making an appropriate decision. However, the research lacks an understanding of what knowledge (both in terms of the SBSC and context-specific aspects) is necessary to be able to make such a decision. Similarly, Jassem et al. [34,42] argue that the role of SBSC knowledge and SBSC experts is currently overlooked in the existing literature. Thus, research is recommended to further look at the relationship between SBSC knowledge, the selection of SBSC architecture and the sustainability performance of a company. Fourth, in addition to the three established SBSC types discussed here, further types have been developed. For example, Hristov et al. [10] introduced a so-called adjusted SBSC. The adjusted SBSC considers an additional critical perspective to address critical aspects in the formulation and implementation of an SBSC. These critical aspects include the concept and structure of an SBSC as well as the integration of environmental and social aspects. In order to prevent the occurrence of the identified critical issues, the authors derive specific goals as part of the additional critical perspective. For each goal, a KPI is included to evaluate the performance target ratio. Since, as the authors state, such an extension also increases the complexity of an SBSC, it must be weighed up in each individual case whether such a critical perspective should be taken into account. In general, future research should consider newly introduced types such as the adjusted SBSC and develop criteria for their advantageousness in terms of the selection of the SBSC architecture.

In terms of implementing the SBSC, there is little research on how to incorporate stakeholder management into the SBSC that goes beyond the connection of the SBSC to sustainability reporting. Journeault [4] criticizes that many frameworks are either unclear or incomplete, and that scholars devote insufficient attention to the integration of stakeholder

management into the SBSC. Thus, in order to improve stakeholder management and to satisfy the stakeholders' diverse need for information, further research in that direction is suggested as well. Similarly, there is also an urgent need to study how managers can initiate processes of organizational learning and contribute to their continuous improvement during the implementation of the SBSC.

6.2. Implications for Practitioners

Besides the implications for researchers, significant recommendations for practitioners can be derived; e.g., in accordance with the results of this article, Sands et al. [9] empirically show how crucial strategic human resource management is to improving sustainable performance. The authors suggest that managers need to be able to change internal processes if needed and to receive the appropriate specific training, and they also emphasize the role of commitment to reach CS goals. Consequently, organizations should provide their employees with the necessary resources, trust, appreciation and training in the process to ensure the success of SBSC implementation.

Overall, the aim of this article was to synthesize the challenges encountered during the process of formulating and implementing an SBSC and ways to overcome them. In this way, a structured procedure for practitioners is offered to successfully navigate this process. Accordingly, it is recommended to test this approach in practice and conduct case studies for its continuous improvement in order to boost the sustainability performance of a company.

6.3. Implications for Policy Makers

Implications for policy makers can also be derived from the findings of the article. On the one hand, research shows that performance measurement systems such as an SBSC have a positive impact on the sustainable development of a company [9]. On the other hand, the integration of sustainable KPIs leads to improved strategic decision making and thus to the improved sustainable development of a company [81]. As a result, policy makers should enact regulations that force companies to address sustainability issues and report their sustainability performance.

Finally, the intention of this article is to encourage both researchers and practitioners to look more systematically at the process of SBSC formulation and implementation as a whole. For such endeavors, the article has hopefully created a good starting point.

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