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Promotion and evolution of sustainability performance measurement systems from a perspective of business process management

From a literature review to a pentagonal proposal

SPMSs from a perspective of BPM

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Abstract

Purpose – The purpose of this paper is to create a conceptual proposal that considers the relevant aspects to guide the promotion and evolution of corporate sustainability performance measurement systems (SPMSs) from a perspective of business process management.

Design/methodology/approach – This study is divided into two phases. The first phase is a literature review with the study question was, “Which aspects need to be considered for promoting and evolving SPMS with a focus on business processes?” The second phase involved comparing these approaches and presenting a conceptual proposal with the relevant aspects for promoting and evolving a corporate SPMS.

Findings – In the literature review, the following aspects were considered relevant to promoting sustainability: strategy, integration, stakeholders, evolution over time and business processes. The conceptual proposal found each aspect relevant and complementary presented consideration for each, forming one SPMS pentagon.

Research limitations/implications – The comparison between the approaches is conceptual.

Practical implications – This study can help organizations address the evolution of their measurement systems systemically.

Originality/value – The summaries of the main considerations and evaluation issues provide starting points for organizations, researchers and students involved in sustainability-related matters. The discussion presented here can help organizations identify the strengths and weaknesses of their measurement systems and provide a basis for the promotion and implementation of improvements.

Keywords Sustainability, Business process management, Corporate strategy, Measurement of performance, Pentagonal framework, Promotion of sustainability

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1. Introduction

The concept of corporate sustainability has taken on importance in recent years (Hahn and Figge, 2011; Linnenluecke and Griffiths, 2010). The term sustainability has been used in reference to an organization's skill at maintaining and concomitantly demonstrating positive economic, social and environmental performance over the long term (Jamali, 2006). This approach is also named "Triple Bottom Line" (TBL) concept, as proposed by Elkington (2004). There is a gap between the concept and practice of sustainability because many organizations work with the three dimensions of TBL, but they do not explore their interconnections (Venkatraman and Nayak, 2010).

In this context, putting corporate sustainability into effect is challenging. As stated by Jamali (2006), the challenge lies in managing the trade-offs of the three dimensions of TBL, that is, the management of potentially conflicting relationships among the three dimensions of TBL. Presumably, this challenge can be won by sustainability management through business processes (Sarkis *et al.*, 2006). Thus, studies tying processes to sustainability issues have been developed by many authors, including Asif *et al.* (2008), Chee Tahir and Darton (2010), Hall and Wagner (2012), Hoesch-Klohe and Ghose (2010) and Johanna *et al.* (2010). Asif *et al.* (2008) suggest that the tools and techniques used to integrate sustainability into business processes normally have an environmental focus and fail in the integration of all aspects of sustainability.

With an environmental focus, Wagner (2007) raises the need to study tools for integrating the processes for improving sustainability performance. Along this line, Hall and Wagner (2012) show that companies that construct their business model with management by processes or a cross-functional approach for solving problems have a better performance in the economic dimension and more positive association with the environmental dimension, which could be true for the manufacturing sector as well as other sectors of the economy.

Kujansivu and Lönnqvist (2008) underscore that management by processes aims to improve business process fluidity and eliminate activities that do not add value. The work by Munstermann *et al.* (2010) complements this concept, affirming the significant impact of process standardization on general performance, considering execution time, cost and process quality. González *et al.* (2010) agree with this assumption and demonstrate that an organization's processes must be improved to improve performance.

To know which processes are more sustainable or which processes need improvement to achieve sustainability-related goals, capacity is necessary for measuring sustainability in a qualitative and/or quantitative manner. This encompasses a broad range of themes (Fiksel *et al.*, 1999). Searcy (2011) states that to monitor corporate sustainability, it is necessary to have a sustainability performance measurement system (SPMS) that measures progress toward identified goals and has a long-term focus while addressing those issues associated with the TBL.

Corporate SPMS has been the object of many studies. For example, a case study on the development of SPMS at individual organizations was presented by various authors, including Krajnc and Glavic (2005). Within the sector scope, some sets of sustainability indicators have been suggested for several industries, including production (Krajnc and Glavic, 2005; Veleva and Ellenbecker, 2001) and the institute of higher education (Fonseca *et al.*, 2011), among others.

For Searcy (2011), the main focus of research has been on the choice of proper performance indicators. However, many other issues need to be addressed, including data, data requirements, attributions of responsibility, communication and the pragmatic use of these indicators. Most of all, the SPMS should be addressed as

a systemic business process to be integrated in an effective manner into the company's strategic planning and day-to-day operations.

According to Kujansivu and Lönnqvist (2008) and Neubauer (2009), business process management (BPM) enables organizations to adapt quickly and, according to Rohloff (2011), it is an important practice for organizational transformation and change. Kohlbacher (2010) adds that the most reported effects in analyzed studies from organizations that adopt BPM as a process management model are as follows: reduction in product or service lead time to the client, improvement in customer satisfaction, improvement in product quality, cost cuts and improvement in the organization's financial performance.

In this work, we assume that the BPM approach is becoming increasingly scientific and is contributing to the development of managerial knowledge around the world. BPM is receiving attention from scientific journals and conferences and is a research subject in many universities (Houy *et al.*, 2010).

Bititci *et al.* (2005) state that any performance measurement system should be balanced and integrated, inform the strategy, implement the strategy, focus on business processes that add value, be specific for business units, include competences and contribute toward stakeholders. Joseph (2012) notes that, in relation to promoting sustainability in organizations, an important gap exists between stakeholder interests and the organization's goals from a profit perspective. This research gap is critical because the lack of such care generates ambiguity and opposing interests.

Many studies have been published with various significant contributions concerning the design of an SPMS, but according to Searcy (2011), special care must be taken in how the SPMS evolves over time. This research gap is critical because corporate sustainability imposes itself as a dynamic challenge by virtue of the continuous changes in priorities.

Thus, although many authors have published many important contributions in relation to SPMS (e.g. Fiksel *et al.*, 1999; Searcy, 2011; Van Aken *et al.*, 2005), publications were not found that focussed on the promotion and evolution of a corporate SPMS with a focus on the continuous management of business processes; thus, another research gap needs to be addressed.

If the actual promotion of sustainability, including a fitting system for measuring performance for the organization, should evolve in response to the changes that take place inside and outside the corporation, the question this study seeks to answer is: Which aspects need to be considered for promoting and evolving SPMS with a focus on business processes?

The objective of this study is to create a conceptual proposal that considers the relevant aspects to guide the promotion and evolution of corporate SPMSs from a perspective of BPM.

The word evolution is used in this study in the sense of updating and monitoring the SPMS and considering necessary changes. The word promotion refers to facilitating, driving and creating favorable conditions for sustainability and management by processes.

2. Sustainability and BPM

Sarkis *et al.* (2006) affirm that it is possible to evaluate business processes from an environmental sustainability perspective, which consists of evaluating costs and analyzing multi-criteria to evaluate improvement alternatives in business processes. Nowak *et al.* (2011) present a taxonomy of parameters for measuring the sustainability of business processes according to the following aspects: first, organizational structure

and customer needs (social dimension); second, reduced gas emissions in processes, software, hardware and infrastructure (environmental dimension); and third, organization competitiveness (economic dimension). They also underscore that the restructuring of business processes, with a focus on sustainability, can guarantee the conception of business processes based on ecological indicators, integration of processes and infrastructure, evaluating the trade-off between ecological indicators and performance indicators, and finally, valorization of human factors and optimization of energy consumption.

Hoesch-Klohe and Ghose (2010) state that it is possible to improve sustainable performance of processes through restructuring when functional objectives are achieved and environmental impacts are reduced. For that to happen, in the same study, the authors also recommend detailing the specifications for processes and their effects, correlating business process objectives to the ability to seek alternative processes through modeling.

This study will consider the strategic objectives rather than the functional objectives, following Burlton's (2010) line, which states that the strategy becomes more tangible when products and services are analyzed, as well as the exchanges with stakeholders and what one intends to exchange in the future with each external stakeholder. For Joseph (2012), an inherent tension exists between the organization's profit goals and the perspective of interested parties, resulting in ambiguities when promoting sustainability because such norms consider the stakeholders' objectives as ends in themselves. With that perspective, the challenge resides in considering the need for equality in the economic and social environments. Thus, Burlton (2010) states the importance of consolidating strategic criteria as follows: first, find inconsistencies and conflicts among stakeholder visions; second, gain agreement through criteria for evaluating alternatives, prioritizing the allocation of resources and removing personal bias in search of a project for solutions; and third, balancing the strategic direction with stakeholder criteria.

Therefore, any performance measurement system should be fully balanced and should inform the strategy. It should implement the strategy with a focus on business processes that add value; it should be specific to the business units and should include competences and stakeholder contributions (Bititci *et al.*, 2005). Burlton (2010) identifies important steps for identifying performance measurements as follows: first, identify those performance indicators to be used in each process; second, associate the indicators in process architecture with the strategic objectives and satisfaction measures for all stakeholders, while prioritizing change processes; third, determine the traceability of measures throughout the value chain; and fourth, identify which measures appear in the processes caused by other processes executed previously.

Therefore, the processes need to be managed using a management by processes approach, which does not merely analyze, design, develop and execute business processes, but should also consider the interaction between these processes, control them, analyze them and optimize them, as affirmed by Kohlbacher (2010). Furthermore, Trkman (2010) states that the BPM could help in the execution of a strategic program, permitting improved correspondence between organizational strategy and the company's business processes. Consequently, it is important to validate the strategic direction, determine the relationship between stakeholders, develop the architecture for the processes, align process governance, prioritize processes for change considering all stakeholders, align the capacities with people, technology, installations and finally, establish a transformation portfolio (Burlton, 2010).

Although many organizations are involved in process improvement initiatives, only a small number of them follow a holistic vision and focus on the level of organizational processes (Neubauer, 2009). This occurs because changing the company's functional management approach to a management by process approach implies defining responsibilities for process progress (Palmberg, 2010), minimizing transfers and thus reducing errors and waiting time, maximizing the grouping of activities and reducing efforts (Antonucci and Goeke, 2011; Paim *et al.*, 2008). In the functional approach, processes are managed in isolation, and the organization has silo characteristics with low capacity for coordination and low market orientation (Paim *et al.*, 2008).

3. Method

This study is divided into two phases. The first phase of the study consisted of a literature review. The study question was "Which aspects need to be considered for promoting and evolving SPMS with a focus on business processes?" Based on that question, a generic search string was elaborated, which was later adapted to the two databases used in the study (ISI/Web of Science; Scopus). The generic string used for the literature review was as follows: < Sustainability Performance Measurement Systems > OR < Sustainability Performance > AND < "process orientation" OR "business process" OR "management by process" > . English was used for the search.

Two criteria of inclusion (CI) were used to select the studies:

CI 1 – present a measurement approach or system for corporate sustainability based on TBL; and

CI 2 – consider the organization's business processes for creating the measurement system.

After conducting the search in the ISI/Web of Science and Scopus databases, the studies underwent two research filters: filter 1 (F1) consisted of reading the title, abstract and key words; filter 2 (F2) encompassed the complete reading of the paper and the references. The studies selected met two CI established previously, and the data extracted were summarized to identify the relevant aspects for creating a corporate SPMS.

The second phase involved comparing these approaches and presenting a conceptual proposal with the relevant aspects for promoting and evolving a corporate SPMS. The proposal presented in this research was developed based on the following: first, literature review about sustainability and BPM: Burlton (2010), Sarkis *et al.* (2006), Hoesch-Klohe and Ghose (2010), Joseph (2012); second, the current proposals for SPMS showed in the literature review: Fiksel *et al.* (1999), Searcy (2011), Chee Tahir and Darton (2010); third, the recommendations to identify performance indicators aligned to process management in firms (Burlton, 2010); and fourth, key aspects highlighted in Phase 1 and presented in Section 4.2. The proposal presented in this research is designed based on a table divided into various aspects identified as relevant. For each of these aspects, a set of considerations is presented. These considerations can be found in the literature review on sustainable performance measurement, suggested approaches toward SPMP elaborations, and also in the literature review on alignment between business strategy and BPM.

4. Measurement of sustainability performance

Organizations try to improve their performance in relation to sustainability, collecting measurable and traceable data with the purpose of, according to Olsthoorn *et al.* (2001), generating and disseminating relevant and accurate information for decision making.

To this end, the indicators should permit an analysis of the cause and effect relationship tendencies and thus go a step beyond primary data (Farrell and Hart, 1998).

For Veleva and Ellenbecker (2001), choosing indicators is not a trivial activity, and therefore, it should be carried out through an ample process and with stakeholder participation for defining the dimensions, unit of measurement, type of measurement (rate or absolute) and period of measurement. Generating sustainability indicators through organizational processes is quite difficult (Fonseca *et al.*, 2011), and thus, it is important to know what information is necessary and how it can be used, in practice, to guide indicator selection (Farrell and Hart, 1998).

According to the level of analysis intended in the measurement process, the types of indicators can be divided into dimension, aspect and sub-aspect and indicator. Dimension can be defined as a broad area of economic, environmental and social areas of stakeholder interest. Aspect and sub-aspect are located under dimension and correspond to more specific categories of evaluation. Indicator is a specific measure of a given aspect to be used to demonstrate its level of performance (GRI, 2006). In the next section, approaches will be presented for constructing a SPMS or process.

4.1 Approaches for constructing SPMSs

Fiksel *et al.* (1999) detail a method that divides the performance measurement process into three phases: planning, implementation and review (Table I). The planning phase aims at providing direction to tasks involved in performance measurement, contributing toward successful evaluation, presentation and improvement of sustainability. The implementation phase requires planning. The review phase consists of reviewing and improving the performance measurement process.

Searcy (2011) developed a framework to structure the evolution of an SPMS (Table II), which provides practical and useful advice and can be easily understood by specialists and non-specialists alike, on how to update the SPMS. The table is divided into three phases: planning for evaluation, conducting the evaluation and monitoring evaluation results.

Following a different approach than Searcy (2011), Chee Tahir and Darton (2010) describe a method to evaluate the degree of sustainability in terms of indicators related to the impacts of sustainability on their private activities. The method considers the impact on capital that resides in three domains: environmental, economic and human and social capital, and it is divided into five steps shown in Table III.

This section introduced three different approaches for identifying performance indicators. The next section will present the discussion through a comparison of these approaches.

4.2 Discussion and comparison of approaches

In the literature review, the following aspects were considered relevant in promoting sustainability: strategy (Bititci *et al.*, 2005; Fiksel *et al.*, 1999), integration (Bititci *et al.*, 2005; Joseph, 2012); stakeholders (Joseph, 2012; Veleva and Ellenbecker, 2001) evolution over time (Searcy, 2011) and business processes (Sarkis *et al.*, 2006; Fiksel *et al.*, 1999; Farrell and Hart, 1998; Chee Tahir and Darton, 2010).

The approaches by Fiksel *et al.* (1999), Searcy (2011), Chee Tahir and Darton (2010) have complementary characteristics in aspects of strategy, integration, stakeholders, evolution over time, processes that add value and competences. Table IV shows a comparative analysis of the approaches by Fiksel *et al.* (1999); Searcy (2011) and

Phase	Steps	Key representative considerations
Planning	Step 1: develop a sustainability policy	If there is no planning, the organization should articulate a sustainability policy. This declaration generally provides the basis for a strategic transformation of the business from a linear model of development to a more holistic and cyclical model
	Step 2: identify the main aspects	In the second step, the following question should be answered: What are the performance's most important aspects?
	Step 3: set objectives	For a subset of aspects identified in Step 2, the company should set objectives for improvement. It is advisable to select a small number of key aspects that provide the basis for sustainability objectives
	Step 4: select indicators	The most challenging step is selecting sustainability indicators that correspond to the declared objectives
	Step 5: define goals	To complete the planning phase, managers should set specific performance goals that represent milestones for improving sustainability over the short and long term
Implementation	Step 6: obtain support	Following the development and demonstration of the measurement board, line manager support should be obtained for successful implementation
	Step 7: integration with business processes	The tools and procedures associated with sustainability measurement must be integrated to existing systems and processes
	Step 8: performance monitoring and report	Monitor progress according to specified goals and report the results to top management and interested external parties
	Step 9: improve performance	Based on performance measurement results, organization teams focus on changes that will improve performance
Review	Step 10: ask for feedback	Ask for organizational feedback on the measurement process; often, reveal inconveniences or gaps in the existing process
	Step 11: review the planning steps	The organization should periodically review and improve selected aspects, indicators, metrics and goals

Source: Adapted from the text by Fiksel *et al.* (1999)

Table I.
Steps in
the measurement
process

Chee Tahir and Darton (2010) regarding strategy, integration, stakeholders, evolution and business process with the following three levels of intensity: absent, moderate and present. Among the challenges in the performance measurement process, Searcy (2011) underscores the need to ensure that it is continuous. Joseph (2012) points to the need to align the organization's strategy to stakeholder interests, and Bititci *et al.* (2005) reiterate the need to focus on processes that add value. The difficulty in including sustainability indicators without first thinking of how the process can improve to eliminate rework and mainly fit necessary changes thus becomes clear.

Considering the strategy aspect, also highlighted by Bititci *et al.* (2005) and Joseph (2012), Fiksel *et al.* (1999) approach begins with the need to establish a policy for sustainability. If one does not exist, the organization should articulate a policy, establishing objectives for improvement without any mention of strategy. Searcy's (2011) approach suggests reviewing internal digitalization policies, plans, programs and procedures, and reviewing priorities for corporate sustainability. Chee Tahir and Darton (2010) consider strategy lightly when they suggest an in-depth review of business

Phase	Sub-steps	Key representative considerations
Planning	Environmental conduct	Review internal digitalization policies, plans, programs and procedures; review priorities for corporate sustainability. Identify changes in the corporate structure that could affect objectives. Review goals and objectives tied to the SPMS. Evaluate data collection capacities and reports. Identify important regulatory changes for SPMS review. Review important voluntary initiatives for SPMS. Study the changes made by the main competitors. Identify the main interested parties, internal and external. Prioritize stakeholder requirements for the SPMS
	Develop objective and scope	Explain the purpose of the SPMS evaluation. Define the limits for SPMS evaluations. Identify the main focal points in the SPMS evaluation. Identify the life cycle stages included in the evaluation. Decide whether the evaluation will include external benchmarking. Determine the capacities required by the evaluation team. Develop a project draft for evaluating SPMS
	Develop an action plan	Determine the extension of the participation of interested parties in the evaluation. Identify the specific interested parties that should be consulted. Develop a preliminary timetable for the participation of the SPMS evaluation of the main stakeholders, internal and external. Establish the SPMS evaluation team. Offer training for the evaluation team; if necessary, explain the roles and responsibilities of the evaluation team. Identify the resources needed to complete the SPMS evaluation
Evaluation	Prepare for the evaluation	Review the previous evaluation results for the SPMS. Conduct a complete review of the existing SPMS. Gather the data needed to support the evaluation. Develop goals in accordance with the stakeholders. Determine methods for engaging stakeholders. Develop clear material in a concise manner for consultation. Schedule consultations with stakeholders. Provide consultation material for stakeholders
	Evaluate the SPMS at specified levels	Conduct SPMS evaluations at specified levels (that is, individual measures, measures of the SPMS as a whole, and/or the relationship of SPMS to the operational environment). Consult interested parties for the complete evaluation. Collect data needed to conclude the evaluation. Develop a summary of the main results, including SPMS strengths and weaknesses
	Evaluate the SPMS	Conduct evaluations of the SPMS at specified stages (that is, conception, implementation and/or use) Consult interested parties for the complete evaluation. Collect data needed to conclude the evaluation. Develop a summary of the main results, including SPMS strengths and weaknesses
Follow-up	Develop recommendations	Consider recommendations that address all levels and phases of the life cycle that were included in the SPMS evaluation. Evaluate the feasibility for implementing each recommendation. Prioritize the recommendations. Develop a clear reason for all recommendations. Develop communication plans for primary and secondary stakeholders. Inform the communications for all interested parties

Table II.
Key considerations
in the SPMS update

(continued)

SPMSs from a perspective of BPM		
Phase	Sub-steps	Key representative considerations
	Implement recommendations	Identify and provide capacities. Identify barriers to implementation. Develop an implementation plan, including the recommended update calendar. Provide the context for updates to all interested parties. Provide the necessary resources. Align implementation processes to the respective internal initiatives, implement recommendations. Offer opportunities for feedback
	Conclude the SPMS review	Monitor the implementation of recommendations. Take all necessary corrective actions. Establish a governance structure to control the SPMS. Explain the continuous role, if any, of the evaluation team. Define a preliminary timetable for the next SPMS evaluation. Reflect on the lessons learned from the evaluation

Source: Searcy (2011, p. 49) Table II.

Table III. Method for evaluating the degree of sustainability by Chee Tahir and Darton (2010)		
Step I	In-depth review of the business operation. The resulting setting includes an inventory of the main processes, along with the input and outputs of associated processes and the interests or concerns of interested parties	
Step II	Definition of sustainability and derivation in business perspectives. The method also requires the selection of a fitting definition of the term sustainable development	
Step III	Definition of the limit for the system, which is governed by two factors: spatial and temporal scales. The spatial scale is the physical size of the system. The temporal scale is the period during which the impacts of company operations are considered. The temporal scale should be sufficiently long to cover time-related effects and, in general, the system limit should naturally be selected to include the resources needed for the business to be evaluated	
Step IV	Sustainability framework. This is the section of the methodology in which indicators and metrics are chosen and designed. The following four items should be considered: sustainability and value domains; generators of internal impact; receivers of external impact and problems; indicators and metrics	
Step V	Verification and modification. To guarantee that the indicators and metrics developed are applicable to business operations, the indicators and metrics must be verified and reviewed through field evaluations and consultations with specialists and interested parties	

operations and stakeholder interests, and they also define sustainability and derive business perspectives.

Considering the aspect of integration, Step 7 in the work by Fiksel *et al.* (1999) seeks to integrate the sustainability measurement system with existing systems and processes. Searcy (2011) recommends conducting SPMS evaluations at specified levels (that is, individual measures and/or of the SPMS as a whole, and/or the relationship of SPMS for the operational environment). Chee Tahir and Darton (2010) focus on guaranteeing the indicators and metrics developed are applicable to the business operation and reviewed using field evaluations and consultation with specialists and interested parties.

Regarding stakeholders, the study by Fiksel *et al.* (1999) does not explicitly consider them. The evaluation phase of Searcy's (2011) study includes several exchanges with stakeholders invited to evaluate the measurement system, develop recommendations, develop action plans and implement recommendations. Chee Tahir and Darton's (2010) approach considers that within the context of a commercial operation's sustainability

Table IV.
Comparison of the approaches by Chee Tahir and Darton (2010), Fiksel *et al.* (1999) and Searcy (2011) for the strategy, integration, stakeholder, evolution and business process aspects

Aspect	Considerations	1	2	3
Strategy	Associate indicators to strategic objectives and uncover inconsistencies and conflicts between stakeholder visions (Burlton, 2010)			
	Gain agreement through criteria for evaluating alternatives, prioritize the allocation of resources and remove personal bias in search of a solutions project (Burlton, 2010)			
	Balance the strategic direction with stakeholder criteria (Burlton, 2010)			
	Analyze the products and services, exchanges with stakeholders, which are intended to be exchanged in the future with each external stakeholder (Burlton, 2010)			
	Identify which measures appear in the processes caused by other processes carried out before (Burlton, 2010)			
Integration	Integration between processes and infrastructure			
	Evaluation of a trade-off between ecological indicators and performance indicators			
	Consider human factors and the optimization of energy consumption			
Stakeholder	Associate the indicators in process architecture with stakeholder satisfaction measurements			
	Invite stakeholders to evaluate the measurement system			
Evolution	Review and modify the SPMS			
	Consider the changes needed in day-to-day management of the process			
Business processes	Identify the performance indicators to be used in each process			
	Associate the indicators in process architecture			
	Determine the traceability of measurements in the entire supply chain			
	Be specific for business units, include competences and stakeholder contribution			
	Detail the specifications for processes and their effects, correlating business process objectives to the ability to seek alternative processes through modeling (Hoesch-Klohe and Ghose (2010))			
	Focus on business processes that add value			
Notes: Fiksel, McDaniel and Mendelhall's approach; Searcy's (2011) approach; Chee Tahir and Darton's (2010) approach; Absent; moderate; present				

evaluation, the owners and those responsible for capital can be defined as business stakeholders identified in Phase I.

The three approaches focus on the evolution aspect. Step V in the approach by Chee Tahir and Darton (2010) focusses on verifying and modifying, which is repeated until a refined set of indicators and metrics is obtained, as those are necessary and sufficient to monitor the business' performance in sustainability. Fiksel *et al.*'s (1999) approach takes the same care. Searcy's (2011) study delves deeper into this aspect by presenting a set of questions to support the life cycle of the performance measurement system.

In the business process aspect, the approach elaborated by Chee Tahir and Darton (2010) considers the understanding of the process twice: in Steps I and IV. Interestingly,

this approach asserts that to guarantee the indicators developed are applicable to business operations, to the indicators must be verified and reviewed through field evaluations and consultations with specialists and interested parties. The term “business process” is absent from Searcy’s (2011) approach. Fiksel *et al.* (1999) consider Step 7 to integrate tools and procedures associated with sustainability measurement to existing systems and processes. There is no analysis and diagnosis of processes and projects for alternative processes before including indicators in any of the three approaches. According to Hoesch-Klohe and Ghose (2010), it is necessary to detail the specifications for processes and their effects, correlating business process objectives to the ability to seek alternative processes through modeling. They also do not consider the evaluation of a trade-off between ecological indicators and performance indicators, as revealed by Nowak *et al.* (2011).

Significantly, it is very difficult to alter a functional management approach to a management approach focussed on processes. According to Paim *et al.* (2008), in the functional approach, the processes are managed separately; the organization has characteristics of silos with low coordination capacity, and there is low market orientation. In this point, the three approaches do not focus on developing process architecture to begin a systemic view of business processes avoiding the functional vision.

5. Conceptual proposal

The five aspects identified in the theoretical foundation and in the discussion should be explored to create a performance measurement system aligning sustainability and business processes. For the strategy aspect, the following points should be valued: associate indicators to strategic objectives and uncover inconsistencies and conflicts between stakeholder visions; gain agreement through criteria for evaluating alternatives, prioritizing the allocation of resources and removing personal bias in search of a solutions project; balance the strategic direction with stakeholder criteria and analyze the products and services through exchanges with stakeholders, which should occur in the future with each external stakeholder.

The following points should be considered for the integration aspect: identification of measures that appear in the processes caused by other processes carried out before; integration between processes and infrastructure; evaluation of a trade-off between ecological indicators and performance indicators; consideration of human factors and the optimization of energy consumption.

For the stakeholder aspect, it is necessary to associate the indicators in process architecture with stakeholder satisfaction measurements and to invite stakeholders to evaluate the measurement system.

For the evolution aspect, it is important to review and modify the SPMS and consider the changes needed in day-to-day management of the process.

Finally, for the business aspect, it is important to accomplish the following tasks: identify the performance indicators to be used in each process; associate the indicators in process architecture; determine the traceability of measurements in the entire supply chain; be specific for business units, including competences and stakeholder contribution; detail the specifications for processes and their effects, correlating business process objectives to the ability to seek alternative processes through modeling and focus on business processes that add value.

The conceptual proposal values the five aspects: strategy, integration, stakeholders, evolution and business processes as presented in Figure 1. The pentagon of SPMS shows that the five aspects discussed are relevant and have complementarities, such as

the following: strategy (Bititci *et al.*, 2005; Fiksel *et al.*, 1999), integration (Bititci *et al.*, 2005; Joseph, 2012), stakeholders (Joseph, 2012; Veleva and Ellenbecker, 2001), evolution over time (Searcy, 2011) and business processes (Sarkis *et al.*, 2006; Fiksel *et al.*, 1999; Farrell and Hart, 1998; Chee Tahir and Darton, 2010). Based on the theoretical review and a comparison of the three approaches, the conceptual proposal was constructed and is presented in Figure 2. All considerations for each aspect identified are detailed in Figure 2.

6. Conclusion

In recent years, corporate performance measurement systems that consider sustainability have been the focus of many studies. However, few studies address corporate SPMSs considering business processes. This is a significant gap because any corporate SPMS should evolve continuously in face of the quick change that occurs in organizations.

This study raised the approaches for creating a measurement system that focusses on business processes. This study identified sustainability measurement system approaches, their ties to the broadly recognized theory and their explicit emphasis on structuring updates using different levels and phases of the life cycle for a measurement system with a focus on processes aligned with the stakeholders' strategy and interests. In a second phase, the following aspects were identified, analyzed and compared: strategy, integration, stakeholder, evolution over time and business process approaches. Based on this analysis, a conceptual proposal for promoting and evolving SPMS with a focus on the business process was developed and presented.

The benefits of having a measurement system will diminish over time if it does not reflect the changes in the organization processes. If an update and a focus on business processes are lacking, decision makers and the main stakeholders will have difficulties in determining whether the company is achieving continuous progress toward its corporate sustainability goals. Drawing on a management by processes perspective and the research conducted by Chee Tahir and Darton (2010), Fiksel *et al.* (1999) and Searcy (2011), to guide the promotion and evolution of a corporate SPMS, it is possible to conclude the following for each of the aspects:

- (1) Strategy: there is no formal phase for validating strategic direction and determining the relationship between stakeholders and the strategy.
- (2) Business process: there is no recommendation for developing process architecture to begin a systemic view of business processes avoiding the functional vision.

Figure 1.
Pentagon of SPMS
promotion and
evolution with a
focus on business
processes

Source: The authors

Strategy	Integration	Stakeholders	Evolution	Business Process
<ul style="list-style-type: none">•Associate indicators to strategic objectives and uncover inconsistencies and conflicts between stakeholder visions.•Gain agreement through criteria for evaluating alternatives and prioritize the allocation of resources and remove personal bias in search of a solutions project.•Balance the strategic direction with stakeholder criteria.•Analyze the products and services, exchanges with stakeholders, which are intended to be exchanged in the future with each external stakeholder.	<ul style="list-style-type: none">•Identify which measures appear in the processes caused by other processes carried out before (Burton, 2010).•Integration between processes and infrastructure.•Evaluation of a trade-off between ecological indicators and performance indicators.•Consider human factors and the optimization of energy consumption.	<ul style="list-style-type: none">•Associate the indicators in process architecture with stakeholder satisfaction measurements.•Invite stakeholders to evaluate the measurement system.	<ul style="list-style-type: none">•Review and modify the SPMS.•Consider the changes needed in day-to-day management of the process.	<ul style="list-style-type: none">•Identify the performance indicators to be used in each process.•Associate the indicators in process architecture.•Determine the traceability of measurements in the entire supply chain.•Be specific for business units, include competences and stakeholder contribution.•Detail the specifications for processes and their effects, correlating business process objectives to the ability to seek alternative processes through modelling.•Focus on business processes that add value.

Source: The authors

Figure 2.
Conceptual proposal
for SPMS promotion
and evolution
with a focus on
business processes

There is also no recommendation for aligning process governance; for prioritizing processes for change considering all stakeholders; for aligning capacities such as people, technology, installations and finally, for establishing a transformation portfolio.

- (3) Integration: an evaluation of a trade-off between environmental indicators and performance indicators is not considered. There is a lack of recommendations for the following: first, identifying those performance indicators to be used in each process; second, associating the indicators in process architecture with the strategic objectives and stakeholders; third, determining the traceability of measures throughout the value chain; and fourth, identifying measures that appear in the processes caused by other processes executed previously.
- (4) Evolution: all approaches consider the evolution of the measurement system, but without day-to-day process management, it is difficult to enable the evolution of the entire measurement system complex.
- (5) Stakeholders: all approaches consider the stakeholders, and there is also a lack of recommendations on the discovery and treatment of inconsistencies and conflicts between stakeholder visions and on equilibrium between strategic direction and stakeholder criteria.

Importantly, a presented proposal should not be static, but rather should adapt to different types of organizations. The proposal can be used as a basis for new research on how to raise stakeholder needs; how to relate the strategic objectives; how much time is necessary to promote a measurement system or how to describe business processes from the client's perspective. Another suggestion is to conduct action research on promoting sustainability and the possible barriers. For future research, the discussion developed in this paper will provide a useful starting point to help center attention on key areas of all phases for promoting sustainability, considering management of the business processes.

This study can help organizations address the evolution of their measurement systems in a systemic manner. The summaries of the main considerations and evaluation issues provide starting points for organizations, researchers and students involved in sustainability-related matters. The discussion presented here can help organizations identify the strengths and weaknesses of their measurement systems and provide a basis for promoting and implementing improvements.

References

- Antonucci, Y.L. and Goeke, R.J. (2011), "Identification of appropriate responsibilities and positions for business process management success: seeking a valid and reliable framework", *Business Process Management Journal*, Vol. 17 No. 1, pp. 127-146.
- Asif, M., De Bruijn, E.J., Fisscher, O.A.M.E. and Stenhuis, H. (2008), "Achieving sustainability three dimensionally", *International Conference on Management of Innovation and Technology*, 4., Bangkok, 2008. *Proceedings [...]*, IEEE, New York, NY, pp. 423-428.
- Bititci, U.S., Mendibil, K., Martinez, V. and Albores, P. (2005), "Measuring and managing performance in extended enterprises", *International Journal of Operations & Production Management*, Vol. 25 No. 4, pp. 333-353.

- Burlton, R. (2010), "Delivering business strategy through process management", in Vom Brocke, J. and Rosemann, M. (Eds), *Handbook on Business Process Management: Strategic Alignment, Governance, People and Culture*, Vol. 2, Part 1, Springer, Berlin, pp. 5-37.
- Chee Tahir, A. and Darton, R.C. (2010), "The process analysis method of selecting indicators to quantify the sustainability performance of business operation", *Journal of Cleaner Production*, Vol. 18 Nos 16-17, pp. 1598-1607.
- Elkington, J. (2004), "Enter the triple bottom line", in Henriques, A. and Richardson, J. (Eds), *The Triple Bottom Line: Does It All Add Up?*, Earthscan, London, pp. 1-16.
- Farrell, A. and Hart, M. (1998), "What does sustainability really mean?", *Environment*, Vol. 40 No. 9, pp. 5-31.
- Fiksel, J., Mcdaniel, J.E. and Mendenhall, C. (1999), *Measuring Progress Towards Sustainability: Principles, Process and Best Practices*, Battelle Memorial Institute, Columbus, OH.
- Fonseca, A., Macdonald, A., Dandy, E.E. and Valenti, P. (2011), "The state of sustainability reporting at Canadian universities", *International Journal of Sustainability in Higher Education*, Vol. 12 No. 1, pp. 22-40.
- González, L.S., Rubio, F.G., González, F.R. and Velthuis, M.P. (2010), "Measurement in business processes: a systematic review", *Business Process Management Journal*, Vol. 16 No. 1, pp. 114-134.
- Hahn, T. and Figge, F. (2011), "Beyond the bounded in instrumentality in current corporate sustainability research: toward an inclusive notion of profitability", *Journal of Business Ethics*, Vol. 104 No. 3, pp. 325-345.
- Hall, J. and Wagner, M. (2012), "Integrating sustainability into firms' processes: performance effects and the moderating role of business models and innovation", *Business Strategy and the Environment*, Vol. 21 No. 3, pp. 183-196.
- Hoesch-Klohe, K. and Ghose, A. (2010), "Carbon-aware business process design in Abnoba", *Proceedings of the International Conference on Service-Oriented Computing (ICSOC-2010), San Francisco, 2010. Proceedings [...], San Francisco, CA*, pp. 551-556.
- Houy, C., Fettke, P. and Loos, P. (2010), "Empirical research in business process management – analysis of an emerging field of research", *Business Process Management Journal*, Vol. 16 No. 4, pp. 619-661.
- Jamali, D. (2006), "Insights into triple bottom line integration from a learning organization perspective", *Business Process Management Journal*, Vol. 12 No. 6, pp. 829-821.
- Johanna, C.A., Santiago, A.M., Carlos, F.R.E. and Carlos, P.R. (2010), "Reverse logistics process automation with BPMS", *ANDESCOM, 2010, Bogotá. Proceedings [...], IEEE, New York, NY*, pp. 1-5.
- Joseph, G. (2012), "Ambiguous but tethered: an accounting basis for sustainability reporting", *Critical Perspectives on Accounting*, Vol. 23 No. 2, pp. 93-106.
- Kohlbacher, M. (2010), "The effects of process orientation: a literature review", *Business Process Management Journal*, Vol. 16 No. 1, pp. 135-152.
- Krajnc, D. and Glavic, P. (2005), "A model for integrated assessment of sustainable development", *Resources, Conservation and Recycling*, Vol. 43 No. 2, pp. 189-208.
- Kujansivu, P. and Lönnqvist, A. (2008), "Business process management as a tool for intellectual capital management", *Knowledge and Process Management*, Vol. 15 No. 3, pp. 159-169.
- Linnenluecke, M.K. and Griffiths, A. (2010), "Corporate sustainability and organizational culture", *Journal of World Business*, Vol. 45 No. 4, pp. 357-366.
- Munstermann, B., Eckhardt, A.E. and Weitzel, T. (2010), "The performance impact of business process standardization: an empirical evaluation of the recruitment process", *Business Process Management Journal*, Vol. 16 No. 1, pp. 29-56.

- Neubauer, T. (2009), "An empirical study about the status of business process management", *Business Process Management Journal*, Vol. 15 No. 2, pp. 166-183.
- Nowak, A., Leymann, F. and Mietzner, R. (2011), "Towards Green Business Process Reengineering", *2010 ICSOC in San Francisco, CA, 2010*, Springer, Berlin, pp. 187-194.
- Olsthoorn, X., Tyteca, D., Wehrmeyer, W.E. and Wagner, M. (2001), "Environmental indicators for business: a review of the literature and standardisation methods", *Journal of Cleaner Production*, Vol. 9 No. 5, pp. 453-463.
- Paim, R.C.S., Caulliraux, H.E. and Cardoso, R. (2008), "Process management tasks: a conceptual and practical views", *Business Process Management Journal*, Vol. 14 No. 5, pp. 694-723.
- Palmberg, K. (2010), "Experiences of implementing process management: a multiple-case study", *Business Process Management Journal*, Vol. 16 No. 1, pp. 93-113.
- Rohloff, M. (2011), "Advances in business process management implementation based on a maturity assessment and best practice exchange", *Information Systems and E-Business Management*, Vol. 9 No. 3, pp. 383-403.
- Sarkis, J., Meade, L.E. and Presley, A. (2006), "An activity based management methodology for evaluating business processes for environmental sustainability", *Business Process Management Journal*, Vol. 12 No. 6, pp. 751-769.
- Searcy, C. (2011), "Updating corporate sustainability performance measurement systems", *Measuring Business Excellence*, Vol. 15 No. 2, pp. 44-56.
- Trkman, P. (2010), "The critical success factors of business process management", *International Journal of Information Management*, Vol. 30 No. 2, pp. 125-134.
- Van Aken, E.M., Letens, G., Coleman, G.D., Farris, J. and Van Goubergen, D. (2005), "Assessing maturity and effectiveness of enterprise performance measurement systems", *International Journal of Productivity and Performance Management*, Vol. 54 Nos 5/6, pp. 400-418.
- Veleva, V. and Ellenbecker, M. (2001), "Indicators of sustainable production: framework and methodology", *Journal of Cleaner Production*, Vol. 9 No. 6, pp. 519-549.
- Venkatraman, S. and Nayak, R.R. (2010), "A performance framework for corporate sustainability", *International Journal of Business Innovation and Research*, Vol. 4 No. 5, pp. 475-490.
- Wagner, M. (2007), "Integration of environmental management with other managerial functions of the firm", *Long Range Planning*, Vol. 40 No. 6, pp. 611-628.

Further reading

Global Reporting Initiative (GRI) (2012), "Sustainability reporting guidelines", 2006, available at: www.aeca.es/comisiones/rsc/documentos_fundamentales_rsc/gri (accessed January 10, 2012).

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3. Leona Aimée Henry, Tine Buyl, Rob J.G. Jansen. 2019. Leading corporate sustainability: The role of top management team composition for triple bottom line performance. *Business Strategy and the Environment* **28**:1, 173-184. [[Crossref](#)]
4. Hourneaux JrFlavio, Flavio Hourneaux Jr, GabrielMarcelo Luiz da Silva, Marcelo Luiz da Silva Gabriel, Gallardo-VázquezDolores Amalia, Dolores Amalia Gallardo-Vázquez. 2018. Triple bottom line and sustainable performance measurement in industrial companies. *Revista de Gestão* **25**:4, 413-429. [[Abstract](#)] [[Full Text](#)] [[PDF](#)]
5. AbeygunasekeraAhangama Withanage Janitha Chandimali, Ahangama Withanage Janitha Chandimali Abeygunasekera, BandaraWasana, Wasana Bandara, WynnMoe, Moe Wynn, YigitbasiogluOgan, Ogan Yigitbasioglu. 2018. Nexus between business process management (BPM) and accounting. *Business Process Management Journal* **24**:3, 745-770. [[Abstract](#)] [[Full Text](#)] [[PDF](#)]
6. Sandra Naomi Morioka, Marly Monteiro de Carvalho. 2017. Discutindo sustentabilidade no contexto de negócios e em relatórios de desempenho: análise de estudos de caso brasileiros. *Gestão & Produção* **24**:3, 514-525. [[Crossref](#)]
7. Marco Bertoni. 2017. Introducing Sustainability in Value Models to Support Design Decision Making: A Systematic Review. *Sustainability* **9**:6, 994. [[Crossref](#)]
8. VuHa Minh, Ha Minh Vu, ChanHing Kai, Hing Kai Chan, LimMing K., Ming K. Lim, ChiuAnthony S.F., Anthony S.F. Chiu. 2017. Measuring business sustainability in food service operations: a case study in the fast food industry. *Benchmarking: An International Journal* **24**:4, 1037-1051. [[Abstract](#)] [[Full Text](#)] [[PDF](#)]
9. EnsslinLeonardo, Leonardo Ensslin, EnsslinSandra Rolim, Sandra Rolim Ensslin, DutraAdemar, Ademar Dutra, NunesNei Antônio, Nei Antônio Nunes, ReisCassiano, Cassiano Reis. 2017. BPM governance: a literature analysis of performance evaluation. *Business Process Management Journal* **23**:1, 71-86. [[Abstract](#)] [[Full Text](#)] [[PDF](#)]