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Integrative Sustainable Intelligence: A holistic model to integrate corporate sustainability strategies

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Abstract

Organizations have been showing a growing awareness regarding the importance of corporate sustainability. However, the integration of sustainability concerns in companies' long-term planning, strategic management, processes, and activities is still challenging, disconnected, and often conducted in isolation. Based on a qualitative exploratory research combining different perspectives found in the literature, the present research presents a theoretical framework that is expected to enhance the adequate development and management of organizational sustainability-oriented practices — the Integrative Sustainable Intelligence model. This model provides organizational managers with a structured framework to adequately understand, select, implement and assess sustainability promoting actions, based on the development of structural and systematic disruptive tools and involving the exchange of collaborative ideas between organizational stakeholders. The adoption of the Integrative Sustainable Intelligence model is expected to foster change processes and innovations in the search for solutions for sustainability-oriented business models.

KEYWORDS

corporate sustainability, integrative sustainability, stakeholders, sustainable development, sustainable strategy

1 | INTRODUCTION

The last five decades have witnessed a growing concern and a broad and important discussion regarding the impact of unsustainable practices. Scholars, professionals, and even common citizens are highly aware of the need to study and change behaviours (Rockstrom et al., 2009). Figure 1 shows main approaches and contributions regarding the implementation of the necessary changes towards sustainability and well-being.

Concerned about the importance of adequately understanding the consequences of human development, the implications of its impacts and the problems caused by a changing lifestyle, the United Nations (UN), during its Conference on the Human Environment in 1972 (UN, 1972), introduced the principles that would later support the concept of sustainable development[1] (SD). This concept would become a sociopolitical, economic, and environmental objective, ratified by the Brundtland Commission in the document entitled "Our Common Future" (World Commission on Environment and Development, 1987). Based on this work, Elkington suggests the understanding of sustainability through a three-dimensional vision, known as "triple bottom line" (TBL) (Elkington, 1999). Sustainability will be achieved through the adequate balance, in each moment, of the economic capital and its profitability, the environmental capital and its preservation, and the social capital and its equity (Jerónimo Silvestre, Antunes, & Filho, 2014).

The definition of SD proposed in the Brundtland report is simple and attractive and has inspired different definitions for corporate sustainability (CS) — namely, the one developed by Dyllick and Hockerts (Dyllick & Hockerts, 2002) and the one developed by Bansal (Bansal, 2005). However, all these definitions have the disadvantage of being vague, which hinders their adequate understanding and operationalization (Lankoski, 2016; Poddar, Narula, & Zutshi, 2019). Therefore, organizations face

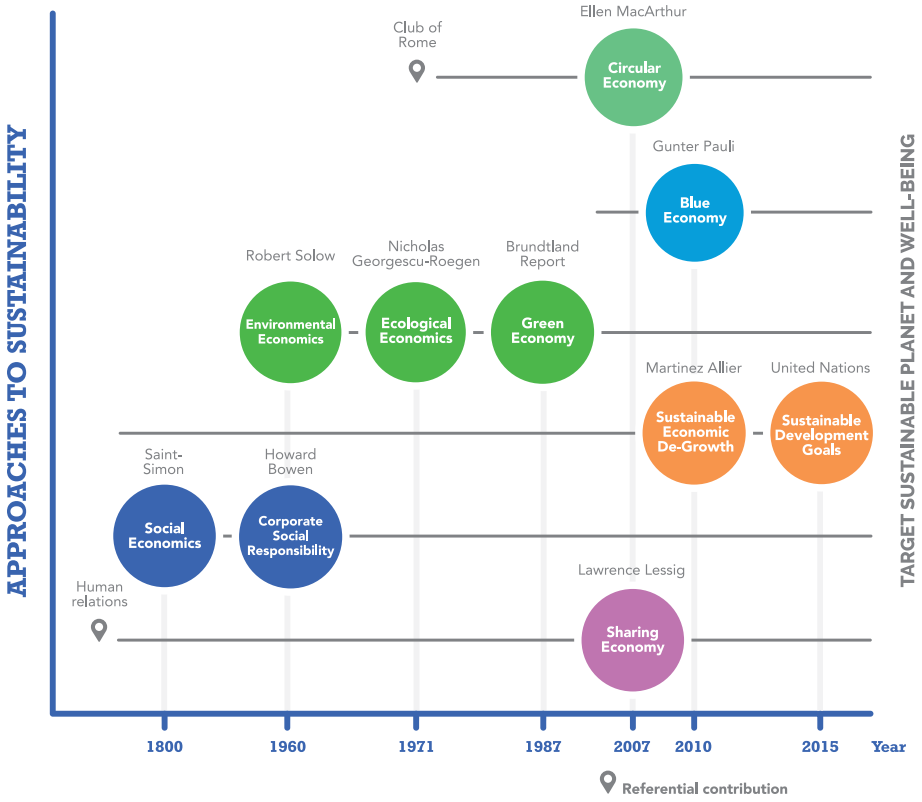

FIGURE 1 Evolution thinking to sustainable planet and well-being

considerable challenges to attend to different stakeholders expectations and to adapt to the different socioeconomic and environmental-economic dynamics (Ostrom, 2009).

In spite of these difficulties, an increasing number of organizations are recognizing the importance of sustainability dimensions and are demonstrating their commitment to sustainability through the integration of this concept in their strategies and management models (Armindo, Fonseca, Abreu, & Toldy, 2019; Stubbs, 2019). According to recent studies, in most cases, the implementation of these strategies has been more superficial than effective, consisting of little more than a response to stakeholders pressures regarding responsible business performances (Schrettle, Hinz, Scherrer -Rathje, & Friedli, 2014). Therefore, it is still very important to continue studying the relation between organizational commitment towards sustainability and its effective implementation and performance.

This scenario leads to the need of developing new proposals aiming the orientation and promotion of organizational involvement with sustainability, leading to the reformulation of organizational behaviours. In this scope, the General Assembly of the UN has defined, in 2015, a new agenda for SD based on 17 principles that led to the Sustainable Development Goals (SDGs), defending that sustainable production and consumption should be widely adopted by 2030 (UN, 2015).

For this transformation to take place, organizations need to acquire the necessary knowledge and skills to promote SD (Dyllick & Hockerts, 2002; UN, 2015) and to adequately understand the mechanisms and interactions needed to integrate improved performances for the organization with improved performances for the environment and also for the different organizational stakeholders (Hörisch, Freeman, & Schaltegger, 2014). This implies the construction of a proactive organizational culture, which will determine how sustainability will be thought, acted, and experienced (Baumgartner, 2014), leading top management towards the adequate understanding of which initiatives should be developed, by whom and for what reason (Manning, Braam, & Reimsbach, 2019). The will to implement sustainability practices should be clearly expressed in organizational strategies, namely, through the economic perspective of the social and environmental dimensions, the mitigation of negative environmental impacts caused by the organization's activities, and the creation of tangible value and benefits for society in the short, medium, and long term (Aarseth, Ahola, Aaltonen, Økland, & Andersen, 2017). To achieve this, the business model should reflect its strategic will to balance the TBL (Stubbs, 2019). All these issues must be assessed through a systematic process that measures the adequacy of the organization's use of resources and of the implemented actions to improve TBL balance (Montiel & Delgado-Ceballos, 2014). Finally, it is through reporting that organizations disclosure their intentions, progresses, results, and future perspectives (Maas, Schaltegger, & Crutzen, 2016). Organizations worldwide are increasingly including in sustainability reports information regarding their contribution to the SDGs (Fonseca & Carvalho, 2019; Poddar et al., 2019; Rosati & Faria, 2019). However, this practice of publicly disclosing information on how an organization is addressing the SDGs is still limited to larger organizations (Rosati & Faria, 2019), to organizations with a higher environmental footprint (Poddar et al., 2019), and to organizations with higher commitment to sustainability frameworks, like the UN Global Compact (Fonseca &

Carvalho, 2019; Rosati & Faria, 2019). As can be noted, the progress towards sustainability is not simple. It is recognized by specialists that the change from a conventional style to a sustainability approach causes several organizational transformations, some of them having profound implications. These transformations are influenced by diverse barriers, drivers, and internal and external key factors that will determine the success or failure of the organizational transition to a sustainability-oriented pathway (Asswad, Hake, & Marx Gómez, 2016).

Pain reinforces this idea by acknowledging that most of the approaches and organizational models were not able to lead to a systemic thinking of integrative actions towards sustainability, due, at least in part, to the inability of organizational thinking to integrate and balance sustainability dimensions (Pain, 2014). Other studies refer the non-existence of a single integration model that allows organizations to implement sustainability practices in their daily activities and in their medium and long-term strategies, using simple and conventional management procedures (Maas et al., 2016; Morioka & de Carvalho, 2016; Rosati & Faria, 2019).

The study described in this paper was based on a qualitative exploratory research, combining different perspectives found in a structured literature review, and aims to explore a differentiating approach regarding the dynamization and integration of sustainability in organizational context. Therefore, the main objective of this paper is to propose methodologies to drive organizations towards the development of structural and systematic disruptive tools in order to materialize their intentions regarding sustainability issues. For this, a framework for sustainability management will be developed, designated as Integrative Sustainable Intelligence (ISI). This framework is expected to provide organizational managers with a structural model that leads to a logical pathway between the development, implementation, assessment, and correction of sustainability-oriented activities.

The main contributions of this research are the following: (a) the development of the ISI framework; (b) the development of a simple approach, structured in functional steps, which allows managers to question the pathway towards organizational sustainability; (c) the understanding of sustainability through a holistic and transversal approach, which is expected to help organizations in the strategic decision-making process regarding the operationalization of CS.

Also, the development of the ISI model, presented in this paper, is expected to provide a theoretical contribution to the subject of organizational sustainability management, enhancing future empirical research projects focusing this model's impacts and relevance and thus contributing to its continuous refinement.

2 | BACKGROUND

The acknowledgement that the present trends regarding production and consumption are unbearable is patent in several scenarios (Costanza et al., 2014) and has led to the understanding of the importance and irreparability of functions and values that are being lost in the natural and social environments, many of which are critical for the adequate operation and balance of different systems.

Some signs are promising counteracts of the present degradation, namely, planet's decarbonization initiatives (Rockström et al., 2017), the UN agenda for SD (UN, 2015), and the clear pressure that stakeholders are exerting on the activities of organizations (Govindan, 2018).

All these reasons motivate organizations to dedicate more attention to the mitigation of negative impacts caused by their activities (Michelon, Boesso, & Kumar, 2013). Nevertheless, it is recognized that there are difficulties in adequately operationalizing organizational sustainability into activities that can be understandable, functional, and quantified (Kyaw, Olugbode, & Petracci, 2017; Lankoski, 2016). This leads organizations to invest in sustainability by mere institutional reaction to stakeholder pressures, without an adequate intelligence approach. Therefore, the actions and behaviours triggered are frequently unrelated with the impacts that should be addressed (Porter & Kramer, 2006) and compromise the effectiveness of innovative actions and opportunities, as well as competitive advantages and value co-creation (Aquilani, Silvestri, Ioppolo, & Ruggieri, 2018).

More important than understanding the impact of sustainability factors, the major challenge faced by organizations, of any size and activity sector, is the lack of transversal knowledge regarding the impacts of their activities, which would allow the adequate understanding of how to integrate sustainability in their daily practices (Shields & Shelleman, 2015). The results of Kiron et al., obtained in a research study focusing large companies, show that 90% of executives perceive sustainability as something important, but only 60% were able to identify sustainability strategies (Kiron et al., 2017).

Many strategies were developed with the aim to overcome this gap between sustainability intentions and sustainability practices, as referred by Bonini and Bové (2014), for example, extension of the scope of products life cycle, organizational strategy focused on sustainability, encouragement of open, honest, and transparent internal dialogues regarding sustainability efforts, support given to innovation, creativity, and initiative regarding sustainability issues (Bonini & Bové, 2014). In this scope, the voluntary implementation of integrated management systems (e.g., quality management, environmental management, and health and safety management) can be a relevant contribution to enhance sustainability-oriented practices. Several research studies have established a connection between the implementation of management systems and improvements in organizational sustainability (e.g., Qi, 2013; Gianni, Gotzamani, & Tsiotras, 2017; Testa, Boiral, & Heras-Saizarbitoria, 2018; Para-González & Mascaraque-Ramírez, 2019) because they share the focus on the relationship with different stakeholders — clients, competitors, and suppliers (quality management), communities and ecosystems (environmental management), and employees (health and safety management). Several authors agree that the integration of sustainability in organizations daily practices is imperative for its adequate development, namely, because of the following: (a) it improves competitivity and general well-being (Scherrer, Daub, & Burger, 2007); (b) it appeals to a holistic vision of the different sustainability dimensions (Lozano, 2015); (c) it allows the typifying of organizations actions and activities (Jerónimo Silvestre, Antunes, & Leal Filho, 2016); (d) it is a relevant part of organizational strategic planning (Baumgartner & Rauter, 2017); and (e) it acts as a conceptual structure in the decision-making processes (Bonn & Fisher, 2011).

Engert, Rauter, and Baumgartner (2016) refer that the proposals developed regarding sustainability integration processes only focus very specific questions, and in spite of the growing interest on these issues, theoretical contributions do not comprise intuitive approaches with practical implementation tools. These authors appeal that "future research should move from focusing on whether or not companies need to integrate corporate sustainability into strategic management to how this could be done in practice" (Engert et al., 2016; p. 2843).

In this scope, the model developed by Mass et al. (2016) must be referred: It considers three factors based on the quantification, management, and communication, through inside-out/outside-in perspectives of analysis (Maas et al., 2016). Another relevant contribution is the model developed by Morioka and de Carvalho (2016), based on organization's performance and considering four factors: processes and practices, skills, proposals, and contributions for the development of competitive advantages (Morioka & de Carvalho, 2016).

A possible explanation regarding why organizational sustainability models do not define the operationalization of sustainability integration is the implicit complexity of its implementation. In order to successfully integrate sustainability in its daily practices, an organization must perform a deep reflection regarding the conception of sustainability that is more suited with its organizational culture, which will have to be reflected on its strategic and operative sustainability management (Lankoski, 2016).

Ortiz-Avram et al. state the need of research studies aiming to increase knowledge and consolidate the notion of integrated sustainability (IS) focusing (a) connections and ethical values, (b) performance in the long term, (c) formal processes to develop IS, and (d) good-practice policies (Ortiz-Avram, Domnanovich, Kronenberg, & Scholz, 2018).

Several authors agree that the necessary change regarding sustainability integration processes is provided by transformation skills resulting from organizational culture (Linnenluecke & Griffiths, 2010), because it is this organizational culture that enables the consolidation and understanding of organizational sustainability goals.

On the other hand, it is recognized that different factors can motivate organizational changing processes and enable the understanding of how organizations integrate and promote interactions of sustainability issues in the different TBL dimensions. The organizational impacts of these factors vary whether they are internal or external, specific or transversal (Lozano, 2015). Examples of internal factors commonly refer leadership, strategies, culture, environmental precaution, risk mitigation, and transparency; as external factors, it is common to see negative publicity, stakeholders pressures, regulations and legislation, and the rising of general social awareness (Lozano & von Haartman, 2018). All these factors are dynamic and depend on the organization's size, structure, and activity sector (Engert & Baumgartner, 2016).

For organizations that have successfully IS issues, sustainability management demands the verification of the scope and impact of organizational changes, as well as the assessment of how the organization is effectively handling its processes and interacting with relevant stakeholders (Doppelt, 2010). For these purposes, it is important to identify not only key internal or external factors but also transversal key factors, common to other organizations. This allows the contextual understanding of possible interactivities between awareness, implementation, measurement, and communication processes, promoting facilitating activities in order to overcome sustainability barriers.

Previous research on these issues highlights the need to develop management models with ability to integrate CS and therefore to enable value co-creation dynamics (Aquilani et al., 2018). The lack of sustainability intelligence leads to reactive and mechanical responses to stakeholder pressures. The absence of a critical and strategical analysis of possible approaches increases the risk of uncertainties regarding possible actions to implement, which hinder the effective integration of sustainability and its associated benefits. Consequently, organizational impact of sustainability-oriented actions is not recognized as "expansion of wealth-welfare-well-being all around" by adopting a "win more–win more" approach, as referred by (Ramaswamy & Ozcan, 2014; p. 31).

Based on literature, the present research assumes organizations as non-homogeneous entities, characterized and differentiated by specific dynamics. Their understanding and operationalization of the ISI will define a framework that reflects their perception degree on different factors.

2.1 | Business models for sustainability

The study of business models has an increasing relevance in CS management. Business models provide a systematic analysis and perspective on how an organization operates and does its businesses, enabling the adequate delineation, observation, implementation, and modification of practices and procedures in different strategic and operational stages (Zott, Amit et al. 2011; Muñoz-Torres, Fernández-Izquierdo, Rivera-Lirio, & Escrig-Olmedo, 2019).

Business models can be defined as "value propositions" that an organization presents to its customers, reflecting the methodologies used to manage its resources in order to create and sustain value over time (Muñoz-Torres et al., 2019).

Literature review shows different approaches and typologies regarding business models, applied to different sectors and economic activities. However, the inclusion of social and environmental dimensions in the study of business models has only taken place recently (Geissdoerfer, Vladimirova, & Evans, 2018).

The adoption and transformation of business models in the context of organizational sustainability depend on the organization's objectives regarding the TBL dimensions (Schaltegger, Lüdeke-Freund, & Hansen, 2016). Organizations have different value propositions with different levels of objectives, which implies the existence of different structural business models (Demil & Lecocq, 2010). Therefore, business models must be aligned with the global strategic objectives defined by the organization.

Sustainable business models should be considered under the scope of a dynamic and permanent interaction system requiring the intervention of multiple stakeholders and the use of diverse resources to develop and provide products and services, taking into account the adequate balance and equity of the TBL dimensions (DaSilva & Trkman, 2014; Zott, Amit, & Massa, 2011).

The context in which organizations operate is not stable, with frequent changes and uncertainties that cannot be completely controlled (Ragsdell, 2000). Organizations promote initiatives involving autonomous measures, promoting synergies and/or complementarities, which will lead to different results and impacts depending on the specific issues under consideration (Jerónimo Silvestre, Antunes, Amaro, & Leal Filho, 2015). This indicates that there is no unique or best answer regarding CS but rather a converging view to a given outcome (Rauter, Jonker, & Baumgartner, 2017).

The focus nowadays is not the product itself but rather a whole set of functional services associated with it, composing its life cycle. The organizational understanding of this cycle (including its economic, environmental, and social impacts) inevitably conditions stakeholder perceptions regarding value propositions, value creation, and value capture and is essential for the adequate organizational orientation towards sustainability.

3 | METHODOLOGY

This study was based on exploratory qualitative research methodology, which is adequate for the development of new explanations regarding how different factors relate with each other, enhancing new approaches and theories regarding a specific segment of reality (Creswell, 2003; Reiter, 2017).

The research study was planned and structured in two stages: literature review on different constructs related with CS management, through systematic and reproducible procedures (Littell, Corcoran, & Pillai, 2008) and the use of the grounded theory (GT) for the generation of new theoretical insights (Glaser & Strauss, 1967). These methodological processes are illustrated in Figure 2.

3.1 | Literature review

A structured literature review was performed in two different steps: (a) planning and (b) optimization (Tranfield, Denyer, & Smart, 2003). It started with an exploratory search for articles on the Thomson Reuters, Web of Science and Elsevier Scopus databases, published between 2008 and 2019, focusing the topics TBL, sustainability integration, CS, intelligence, and value co-creation. A total of 570 papers were found, which were divided in different categories in order to enable the perception of the initial scope of the research field (Creswell, 2003). A refinement selection was then performed, excluding those articles that did not focus directly the research topic. A total of 120 papers remained at this stage, focusing the integration of organizational sustainability and organizational sustainability practices. These papers were then subject to content analysis (Berg, 2009) in order to provide data to feed the GT methodology.

3.2 | Grounded theory

GT is a methodology developed by Barney Glaser and Anselm Strauss regarding qualitative research, explicitly focused on the generation of new theoretical insights based on systematic strategic processes of information collection and analysis (Glaser & Strauss, 1967). By the identification of causal connections in specific contexts, GT enhances non-linear integral approaches to understand the multifaceted dynamics of complex systems (Charmaz, 2006).

GT was developed as a response to the gap existing between theoretical and qualitative empirical research, given the predominance of quantitative methodologies in social science studies (Gibbons et al., 1994; Glaser & Strauss, 1967; Jupp, 2006). Through GT, it is possible to use exploratory research in the development of models aiming to study different social contexts, even if the researcher has little control over the studied phenomena. GT emphasizes strategic approaches in the development and construction of theory from data (Foley & Timonen, 2015; Jupp, 2006).

In qualitative data analysis, Glaser and Strauss (1967) refer that the phenomenon can be explained through an inductive approach, a deductive approach, or a combination of both. Deductive research is based on the absence of predetermined theories to guide information and data collection. Inductive research is associated with interpretative approaches, allowing the researcher to use subjective reasoning based on real experiences (Ridenour & Newman, 2008). To Glaser and

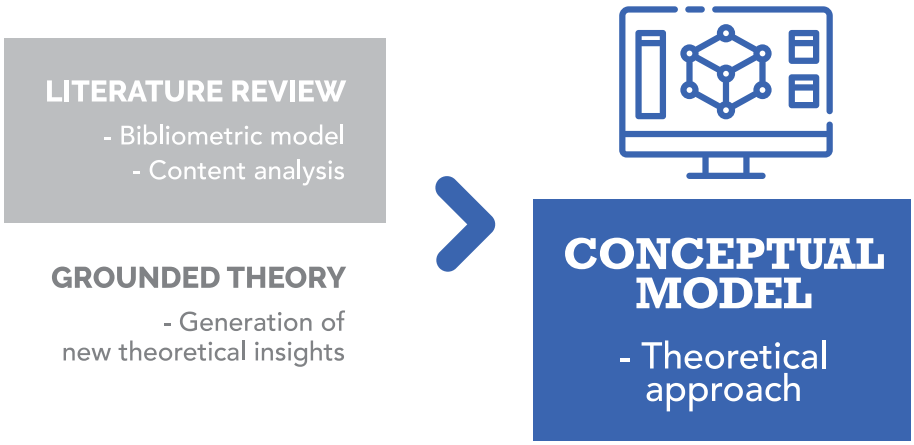

FIGURE 2 Mixed methods approach to propose the conceptual model

Strauss (1967), research can generate either formal or substantive theories. Formal theory is developed in a broad scope research area, whereas substantive theory provides interpretation to a delimited problem in a particular area (Charmaz, 2006).

The present research study develops its research objectives through formal theory. GT will be used to explore how predictive management can enhance IS solutions leading to more sustainable business models. Based on contributions that enhance the dynamics and causal connections between sustainability and its integration in business plans, information gathered in the literature review will be used to develop an integrated, delimited, and universal theory regarding the research problem, giving analytic/inductive support to the research. GT methodology enhances the understanding of the meaning of data in several circumstances and therefore uses evidence to propose concepts by studying and examining information through successive levels of analysis (Charmaz, 2006). The concept this research aims to propose is a framework focusing organizational sustainability management, designated as ISI, described in the following sections.

4 | INTEGRATIVE SUSTAINABLE INTELLIGENCE

Corley and Gioia identified two requirements to achieve a theoretical contribution: originality, obtained by exercising a different point of view and usefulness, obtained by contributing to a broader understanding of the research subject (Corley & Gioia, 2011). The framework ISI proposes an alternative management model for CS, which complies with both requirements referred above: It provides new dynamics and understanding regarding organizational change through the adaptation of alternatives and considers different requirements and methodologies to foster the transition to a sustainability-oriented model. The usefulness of this framework is obtained through the development of a new concept that contributes in practice for the understanding and enhancement of organizational transition for sustainable management models.

The transition from economic models, focused on profit maximization, to models aiming the conciliation of economic, social, and environmental values, can be achieved either through small evolutive changes and/or radical change processes (Carroll & Shabana, 2010). Changes represent opportunities, which must be anticipated, prepared, and managed. Ignoring the need to implement the required changes implies not responding to new challenges and opportunities, with consequent losses at the economic, social, and environmental levels. ISI framework, described in the following sections, aims to contribute with a new insight regarding organizational change in the transition towards sustainability.

4.1 | Model conceptualization

ISI is defined as the material, technical, managerial, and leadership skills that an organization requires, in each moment, regarding the adaptation of its resources, emotions, motivations, expectations, commitments, and behaviours. This adaptation should be based on a set of transversal or specific factors that produce the necessary information to adequately manage the planed sustainability dimensions.

"Integrative" is understood as the capacity to align different operational and functional factors to enable the connection needed to achieve the intended organizational goal, which will define the extension and scope of the integration required (Iraldo, Testa, & Frey, 2009; Oertwig et al., 2017).

"Organizational sustainability" is understood as the search for ideal dynamic states regarding TBL dimensions, based on the principles of precaution, interdependency and connections, efficiency and assessment, and integrity and equity. This search enables the development of skills that will enhance organizational evolution to new levels of assurance, balance, and healthy maintenance of the different systems and subsystems relevant for CS (Costanza & Daly, 1992; Jerónimo Silvestre et al., 2014; Lamberton, 2005).

"Intelligence" is based on the concept developed by Moratis and Melissem (Moratis & Melissen, 2019) consisting of three different levels: (a) naive intelligence, (b) native intelligence, and (c) narrative intelligence. This concept is complemented with the approach of Daniel Goleman that defends different patterns of intelligence directly related with self-conscience, impulse control, persistence, enthusiasm, empathy, self-motivation, and social skills (Goleman, 1995).

Therefore, "intelligence" is understood as the capacity to learn from experience and to provide rational, emotional, social, and ecologic responses in the scope of the present context and environment (Goleman, 2010; Moratis & Melissen, 2019).

In this sense, ISI translates the ability of organizations and stakeholders to apply knowledge and experience in the contexts affected by organizational impacts, enhancing alternative proposals, solutions, and proactive behaviours. These are expected to contribute to global sustainability, considering both the perspective of supply and demand/consumption.

4.2 | ISI framework development

ISI framework aims to allow its users to create and develop alternatives regarding the management of uncertainties in sustainability-oriented measures, enabling the implementation of adequate control systems regarding input and output variables and indicators. ISI is expected to provide a structured, dynamic, and integrated contribution for the organizational management of alternatives regarding the achievement of a rational functional change in the scope of CS, enhancing creative converging solutions. Figure 3 shows the ISI framework structured in four phases: (a) discover; (b) create and add value; (c) value co-creation; and (d) act and consolidate. All these phases are flexible and complement each other.

4.2.1 | Discover

The "discover" phase is related with the need to define the level of knowledge required to clarify a given situation or problem, which is

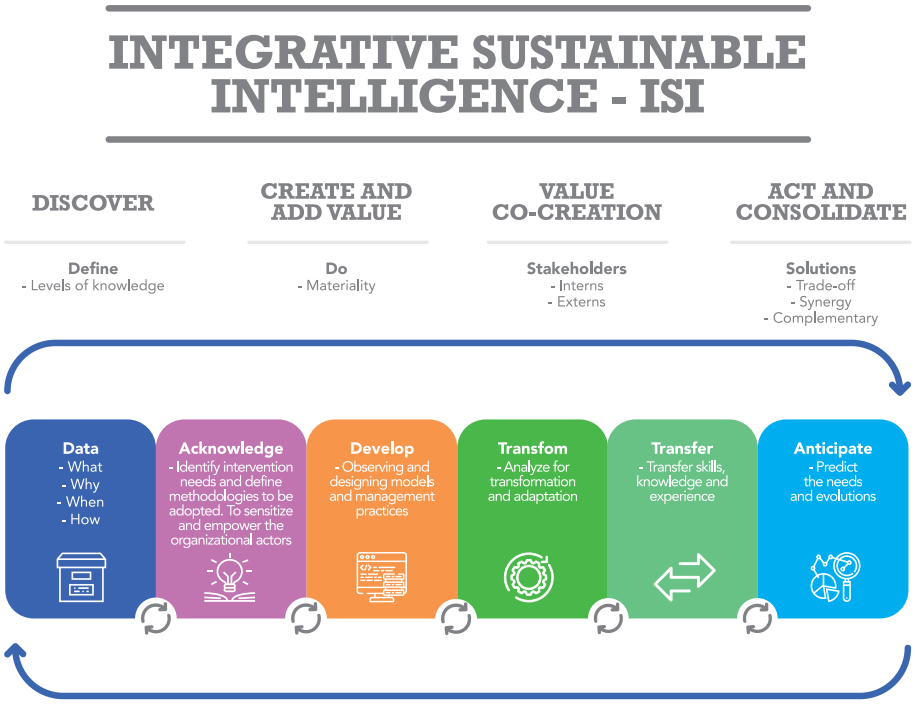

FIGURE 3 Integrative Sustainable Intelligence framework

meant to be solved or anticipated. Time spent in this stage is directly related with the required level of precision, the scope of the problem and its complexity level, the extent of the objectives, and its expected impacts. Two stages compose the "discover" phase: data and acknowledgement.

Data

Data are knowledge, defined as the set of structured, unstructured, and semistructured information obtained from heterogeneous sources (Sherman, 2015). In data analysis processes, the "What, Why, When, and How" set of questions is crucial to enable value creation, given its contribution to adequately understand the reality and context of the situation/problem under analysis (Verhoef, Kooge, & Walk, 2016).

The collected information should represent knowledge, should be materially important and should contribute to the understanding of the problem. On the other hand, it should enable the definition of solutions regarding the adequate procedures and behaviours that will enable the delivery of the right products and services, to the right client, on the right time and at the right amount, causing the least possible negative impact and promoting the highest possible positive impact. All these dimensions should be integrated in a business model that enables the re-assessment of procedures, behaviours, products and services, according to individual, social, environmental and economic needs, with the aim of sustainable value creation.

Acknowledgement

In the search for maintaining competitive and resilient processes, it is critical for organizations to adequately deal with and understand the available information, given the constant evolution and volatility of conditions and the unpredictability of the contexts in which they act.

In this scope, it is consensual among specialists that organizations need to develop and create skills and mechanisms for fast adaptation, flexibility and innovation, in order to timely recognize and adapt to a changing context (Kok & Driessen, 2012). Possible negative impacts and consequences will be reduced if organizations adequately and timely identify the need to implement changes.

Klarner, Probst, and Soparnot (2008) define organizational change capacity as "an organization's ability to develop and implement appropriate organizational changes to constantly adapt to its environment" (Klarner et al., 2008; p. 58). According to these authors, change is not an isolated event because multiple changes occur over time. Therefore, change capacity is a "dynamic capability" that comprises not only the organizational process of continuous learning and adjustment but also the organizational capacity to implement the necessary changes (Klarner et al., 2008).

In this step of the ISI framework, the knowledge obtained through data collection and analysis is expected to enhance the generation of ideas and proposals regarding the recognition of problems to be solved, calling upon internal and external stakeholders. The generation of ideas is developed through design and dynamic thinking processes and solution proposals should flow naturally without categorization. The scope of the problem will enhance the survival of the proposals with the highest degrees of consistency and potential, which will be naturally encouraged. The solidity of the selected proposals will depend on the predefined criteria of acceptance and of the incremental dynamics created for the required change. This dynamics will depend on stakeholders behaviours and also on organizational leadership, governance and culture (Judge, Naoumova, & Douglas, 2009). At the end of this phase, several solutions should be under consideration for the next steps.

4.2.2 | Create and add value

It is consensual that organizations have the core purpose of creating value. As referred by the International Integrated Reporting Council, "value created by an organization over time manifests itself in increases, decreases or transformations of the capitals caused by the organization's business activities and outputs" (International Integrated Reporting Council, 2013; p. 10). A central issue in discussions regarding value creation is the context in which value is created: time, place and stakeholders involved will be determinant for the effective understanding of value creation (Vargo, Maglio, & Akaka, 2008). There are many possible definitions of value, including value-in-use and value-in-exchange (Vargo, Maglio et al. 2008), and no consensus exists regarding the effective contribution of the different value-creation components.

In this phase of ISI model, organizations are expected to understand their responsibility regarding the need to create value in different contexts of social and environmental capitals, without questioning the dynamics of the economic value. The organization's understanding regarding these issues will result either in the expansion or in the reduction of efforts and investments in the different dimensions of organizational value. Adequate organizational capacity to create materially responsible value in these dimensions is of major importance because it will impact all stakeholders.

Develop

The proposals and new ideas identified in the previous stages must be analysed, and decisions must be taken regarding the viability of their implementation.

The purpose is to draw and develop a model allowing the materialization of the proposals under analysis, including the definition of priorities, the identification of necessary and available resources and the understanding of all implications associated with the proposal's implementation. The need for modification in case of new insights (e.g., new information or new technological options) should also be considered.

This process is expected to enhance the development of a possible solution for the problem under analysis, through a functional and iterative process that should be adequately planned, assessed and whenever necessary, readjusted, in order to broaden value creation opportunities.

A critical factor in this "develop" stage is the adequate promotion of interactions that will foster the transformation of intangible experiences into tangible ones. This can affect channel selection processes, with potential market implications, enhancing innovation procedures and improvements in organizational efficacy and resulting in organizational differentiation and improved competitiveness.

Transform

This stage is expected to promote change through the synergistic effects of the adaptability and learning capacities enhanced in the previous stages. These new organizational skills will stimulate new behaviours and enhance innovative performances throughout the organization, impacting and influencing the surrounding environments.

It is expected that the development of new solutions, materialized in innovative behaviours, products, and services, will provide answers to specific problems and market needs.

Those who are responsible for organizational strategy should be able to recognize their limitations regarding the knowledge of all the answers to the different problems. Two approaches can be used to overcome this limitation: one directly connected with organizational operations, considering employee motivation, participation and recognition — social capital — specially focusing those who are in the middle or bottom of the organizational pyramid (sustainability operatives); another approach is to foster the participation of a broad scope of stakeholders in the search for answers, enabling the continuous collection of ideas, opinions and suggestions, which will enhance alternative solutions to both specific and more generalized problems. This plural approach should be seen as an intangible asset in the search for solutions (Freeman, Harrison, Wicks, Parmar, & Colle, 2010).

The transformation process should be structuralist, multidimensional and multidirectional and should promote organizational transformations at different levels — including systems, procedures and behaviours — transferring its actions to different contexts and stakeholders. This process must consider historical and contextual considerations that underlie transformations, such as technological changes in products and services that have shaped social, economic and environmental habits and contexts over time.

This organizational transformative vision is expected to create the basis for new scenarios and forecasts. This will enable the development and implementation of visionary strategies to change future habits and practices.

4.2.3 | Value co-creation

The "value co-creation" stage aims the management of the planned change through a participative process, in which the organization and its stakeholders are included and through which knowledge is generated and transferred.

Because the value incorporated in a product or service is defined by its use (value-in-use) and not by its cost (value-in-exchange), the determination of the incorporated value is up to the final user (Vargo & Lusch, 2008).

As referred by Saarijärvi et al. (2013), it is crucial to adequately identify and understand "what kind of value is cocreated for whom, using what resources, and through what mechanism" Saarijärvi, Kannan & Kuusela, 2013). The amount of value co-created, as well as its perception, depends on the specific circumstances and actors present in this interaction, namely, the organization, its clients, business partners and society. This interaction may occur in different forms: business to consumer, business to business, business to governance or business to employee.

Transfer

This stage of the ISI framework deals with the interactivity of the knowledge generated in the scope of the new ideas and interactions

with stakeholders, achieved in the previous stages. The established interchange is a semiotic relationship between the form and the content of the solutions to be implemented. This transfer is materialized through information interchange and knowledge communication between the organization and its internal and external stakeholders (Agle, Donaldson, & Freeman, 2008). The desired effect is the production of impacts between the different actors, which can be either positive or negative, and will vary in intensity and direction.

The transfer process is characterized by a high level of complexity regarding interactivity promotion either inside the organization and between the organization and its surrounding environments (Minbaeva, 2007; Spraggon & Bodolica, 2012). This is mostly given to the non-linearity of the relationship process established between the organization, as knowledge holder and the stakeholders, as knowledge users (Wood, 2010). The knowledge transfer process will therefore condition the stakeholder's use of this knowledge.

Knowledge transfer is achieved through the use of relational networks established between all interacting parts in this process that share culture, history, language, political and social institutions (Lundvall, 1992). Innovative production systems are enhanced in this interaction promoting environment, which also results in dynamic processes of collective learning. This transfer process cannot be standardized, it must be promoted, adopted, and communicated according to the characteristics and maturity level of the organization and its stakeholders (Minbaeva, 2007). Therefore, the "transfer" stage is expected to result in a change process, triggering modifications in interactions and relationships, based on a two-direction flow of events: inside-out and vice-versa.

4.2.4 | Act and consolidate

The expression "the future is now" raises a series of questions regarding what kind of actions should be assumed and developed, which is the most adequate time frame, and what are the potential management risks and impacts in social, environmental and economic dimensions. The knowledge acquired in the previous stages is an important basis to adequately act and predict impacts and consequences.

This last phase of the ISI framework deals with the implementation of the selected actions and the assessment of their impacts, enabling the organization to assume a consolidated position in problem anticipation and solving and enhancing new discoveries and new processes.

Solutions

In the previous stages, choices have been made, and consequently interrelations have been established between different actors, in the scope of a specific problem that needs to be solved. The results obtained lead to three possible types of solutions, with different impacts for the organization and its stakeholders:

I. Compromise solutions ("trade-offs"): Some factors have been compromised to favour other factors. This option requires a complete understanding and acknowledgement of the positive and negative consequences and of the strategic position that the organization should adopt in face of this problem to effectively and efficiently achieve the aimed impact.
II. Synergistic solutions: This option will enhance higher collective performance levels when compared with individual actions. Therefore, the adoption of solutions with multiple associated factors will result in improved impacts in the process of problem solving.
III. Complementarity solutions: The different solutions have a supportive effect and will complement each other in the contribution to problem solving.

Anticipate

The notion of risk emphasizes the incalculable element of future, translated in several dimensions and resulting in different impacts with different intensities. Therefore, organizations seek for options to effectively anticipate and manage risks, with the aim of understanding something that is not yet present but can happen at any moment (Beck, 2002). Antecipatory actions like imagining, designing, modelling, and simulating, are demonstrations of atemps to conquer a favorable position in the face of a not yet present condition that is called "future."

Organizations are recognized to live and compete in a world with economic, social, and environmental interconnections and therefore have difficulties in independently resisting, or trying to resist, to unexpected events although maintaining a competitive position. The capacity to resist and respond to external and internal events and recover from them is called "resilience" (Rose & Krausmann, 2013). However, not all organizations are able to overcome and successfully adapt to these events, which are occurring with increasing frequency, diversification and associated challenges.

Thus, on the scope of organizational resilience, management is challenged to recognize and understand all its organizational levels and to proactively structure them in order to turn resilience into a competitive advantage, improving the ability to adequately respond to external and internal events (Sawik, 2013). In this scope, the "act and consolidate" stage should be based on the challenge to transform organizational resilience in a set of preventive actions. Management should be involved, and resources should be provided, in a proactive strategy, based on a set of practices capable of fostering the daily effectiveness of operations and processes. Thus, through the pathway defined by the ISI model, organizations are expected to increase the ability to forecast the need for evolution, anticipating events, and thus enhancing new discoveries.

5 | CONCLUSIONS

The ISI framework proposed in this research is oriented to the analysis, understanding, enhancement and implementation of proposals with impact on CS. This framework's design was based on a qualitative exploratory research combining different perspectives found in the literature.

The main contribution of the present research was the development of a guide to how organizations can systematically understand, select, implement and assess the sustainability they want to practice, enabling a holistic approach that can lead to the solution of specific problems and prevent potential negative impacts in the future. The proposed model is based on a flexible and circular approach, that enhances organizational skills regarding sustainability-oriented problem solving.

The ISI framework aims to link the "why" arising from a specific problem with the "how" conducting to the problem's solution, enhancing change and adaptation skills. This process should be built on the creative skills of the different actors in the different stages of the solution seeking process, thus promoting the analysis of how different choices may impact organizational sustainability.

The model developed in this research can be used in a non-linear implementation process, because its different parts and stages may be individually implemented to identify and analyse specific issues, either in a preanalysis stage or in the development of action plans.

A key factor in the ISI framework is its ability to foster the exchange of collaborative ideas between different stakeholders, enhancing change processes and innovative approaches in the development of products, services and solutions oriented towards sustainability business models.

The research presented in this paper has the inherent limitation of theoretical explorative studies — it is not supported on empirical evidence, and the interpretation of information is influenced by the authors' perspective. Therefore, empirical research regarding the operationalization of the ISI framework in real-case scenarios is essential to validate this theoretical model. As future works, an empirical research is being developed with the aim to identify internal, external and transversal key factors that will contribute to success in the different stages of the ISI framework and to analyse its impacts in different scenarios. It is our expectation that this new approach regarding decision-making oriented to CS may enhance future research works aiming the continuous refinement of the proposed model and its validation through empirical research.

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ENDNOTE

[1] Certain authors understand the terms sustainability and sustainable development as synonyms.

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