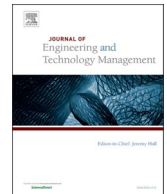




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Demystifying the process of sustainable business model innovation: Renewing dynamic capabilities theory through a systematic literature review

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ABSTRACT

Addressing escalating socio-ecological challenges requires rethinking business innovation through the lens of sustainability. Sustainable Business Model Innovation (SBMI) has emerged as a key process enabling organizations to create, deliver, and capture value while reducing socio-ecological impacts—contributing to long-term resilience. Yet, its underlying mechanisms remain underexplored. This paper conducts a systematic literature review, with an in-depth analysis of 74 selected articles to contribute to the demystification of such innovation processes. The findings identify dynamic capabilities as a key theoretical lens and highlight three levels of microfoundations: internal organizational design, external interactions, and ecosystem orchestration. The study emphasizes the role of relational leadership capabilities and introduces the novel concept of projection capability, a forward-looking dynamic capability supporting systemic transformation. These contributions enrich dynamic capabilities theory and offer guidance for firms engaged in sustainability transitions. The paper concludes with a research agenda aimed at deepening understanding of SBMI through this expanded theoretical perspective.

1. Introduction

The flourishing of human life on Earth is under threat, and the situation is getting worse with each passing day (Richardson et al., 2023). In response, governments, businesses and citizens are taking up the issue. At company level, innovation needs to be redefined, and the concept of eco-innovation is gaining ground. Eco-innovation refers to a transformation in the techniques, processes, products, services, business models, and ways of organizing production and marketing, resulting in a net decrease in the environmental impact of economic activity (De Jesus, Mendonça, 2018; Vence and Pereira, 2019). As highlighted by Muñoz-Torres et al. (2019), given the magnitude of socio-ecological challenges, the only viable solution appears to be the widespread adoption of sustainable business models. Organizations must address emerging economic and environmental issues in a systematic and holistic way (Bocken, van

Abbreviations: ETM, Engineering and Technology Management; SBM, Sustainable Business Model; SBMI, Sustainable Business Model Innovation; SLR, Systematic Literature Review.

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Bogaert, 2016) notably by reconfiguring business models through eco-innovation approaches (Boons and Lüdeke-Freund, 2013). Eco-innovation can be understood either as the outcome of a process or as the process itself that leads to this outcome (Hazarika and Zhang, 2019). For instance, in the context of eco-innovation in business model, it can refer to the outcome - a sustainable business model (SBM) - or the process through which this outcome is achieved - a sustainable business model innovation (SBMI). This quest in embedding socio-ecological factors into business model innovation processes is referred to SBMI (Bocken and Geradts, 2020), which will be the main focus of this manuscript.

A business model represents the holistic and systemic structure of activities that constitute a firm's value architecture (Clauss et al., 2019). It is commonly conceptualized as a focal firm's framework for value creation, delivery, and capture (e.g., Teece, 2010; Zott et al., 2011). While traditional business models emphasize novel value architectures to seize new market opportunities and revenue streams (Beltramello et al., 2013), SBM integrates economic, ecological, and social value creation through a continuous progression of practices (Boons and Lüdeke-Freund, 2013). Bocken et al. (2014) define SBM as the outcome of a strategy that simultaneously pursues the triple bottom line while engaging a diverse set of stakeholders with varying economic and socio-ecological interests. A company cannot be deemed sustainable merely by offering an eco-friendly product if other activities within its business model remain environmentally harmful. Sustainability must be embedded throughout the entire process, requiring a substantial integration of sustainability principles into the value architecture and core activities, with a strong emphasis on the surrounding environment and the broader ecosystem in which the firm operates (Bashir et al., 2022).

SBMI can be defined as: "Innovations that create significant positive and/or significantly reduced negative impacts for the environment and/or society, through changes in the way the organisation and its value-network create, deliver value and capture value or change their value propositions" (Bocken et al., 2014, p. 44). It corresponds to the transformation or the emergence of an SBM, with a holistic change, introduced at the core of the business model to tackle unsustainability at its source (Geissdoerfer et al., 2018). Furthermore, SBMI has the potential to provide a sustainable competitive advantage (Bashir et al., 2022). SBMI contributes to tackling the challenges of sustainability (Steffen et al., 2018), produces higher returns than technological innovations (Chesbrough, 2007; Lindgardt et al., 2012) and may have the added benefit of better risk mitigation and greater resilience (Choi and Wang, 2009; Osterwalder and Pigneur, 2010).

Nevertheless, the literature shows that SBMI is something of a "black box" (Ringvold et al., 2022). There are a number of aspects that deserve greater attention, including the phases a company goes through or the influence of managers, behaviors, capabilities, processes or organizational structures (Geissdoerfer et al., 2018; Xavier et al., 2020). This lack of understanding of the micro-foundations of SBMI is problematic and reflects the insufficient support available to companies in their transformation process. Indeed, many business model innovations fail (as many as 90% of initiatives (Patel, 2015)) and SBMI is much more complex (Evans et al.,

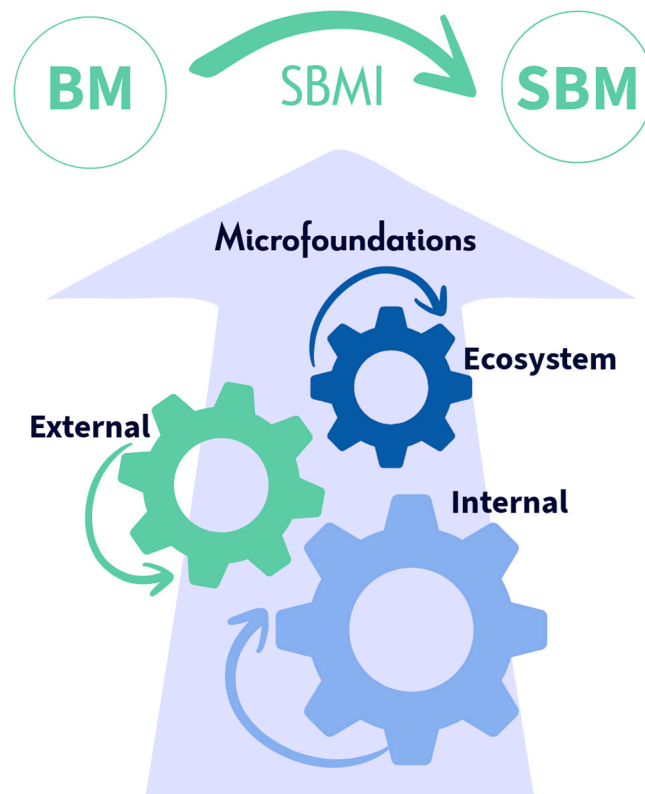


Fig. 1. Microfoundations of SBMI EI=Eco-Innovation, SBMI= Sustainable Business Model Innovation.

2017). This leads to considerable delays in the adoption of SBMI (Geissdoerfer et al., 2017).

Despite growing academic attention around SBMI, managers are still navigating in the dark (Geissdoerfer et al., 2018; Ringvold et al., 2022). Although some authors have proposed organizational supporting tools for eco-innovation (e.g. Xavier et al., 2020), none of them consider the specificities of SBMI that requires innovations in the internal management as well as in the interactions with the business ecosystem (e.g. Evans et al., 2017; Fobbe and Hilletoft, 2021; Pichlak and Szromek, 2021). As stated by Minatogawa et al. (2022, pp. 2–3), organizational design is a “critical managerial change lever” that still needs to be explored to perform SBMI. Therefore, the following research question emerge: How do organizations innovate towards sustainable business models (SBMI)?

Each innovation is developed through dedicated organizational practices, but SBMI calls for a higher level of sophistication. As stated by Shakeel et al. (2020), SBMIs are often the result of a series of organizational and technological innovations, which are internally as well as externally oriented. Indeed, addressing sustainability often requires companies to move from a firm-centric focus in their operational logic towards intensive interaction with an ecosystem of actors (e.g. Bolton and Hannon, 2016; Evans et al., 2017; Schaltegger et al., 2016). Beyond strategic intent, SBMI requires concrete managerial decisions related to R&D organization, technology portfolio governance, new product development, and the coordination of interdependent engineering projects across organizational and ecosystem boundaries. In this sense, SBMI is not only a strategic or leadership challenge, but also a technology and engineering management issue that directly affects how firms build, deploy, and renew their technological choices and organizational capabilities (Schiaivone et al., 2025). This paper aims to investigate the state of the art regarding the internal and external organizational practices underpinning SBMI. The aim is to understand SBMI’s microfoundations to help managers develop innovation potential aligned with sustainability goals. Such an understanding is essential for engineering and technology management (ETM), as it enables managers to organize innovation activities, govern technology development, and coordinate collaborations across organizational and ecosystem boundaries. Fig. 1 below illustrates our research objective.

This study employs a systematic literature review (SLR). From an initial pool of 2368 articles, 74 were retained for in-depth analysis. The findings underscore the central role of dynamic capabilities theory in explaining SBMI, establishing it as a foundational framework for assessing such innovation processes. The microfoundations - the processes, procedures, structures, skills or organizational activities (Tece, 2007) - of such dynamic capabilities will be analyzed at three levels. First of all, the results will discuss SBMI’s internal microfoundations related to culture, structure, strategy and other internal management elements. Subsequently, the analysis will focus on the interrelations between the firm and its business ecosystem. Business ecosystem may be divided into two parts (Adner, 2017; Jacobides et al. 2018; Hou and Shi, 2021). The first part refers to all the organization’s ‘external’ activities and strategies, which represent our second level of analysis. External activities, such as open innovation (Pichlak and Szromek, 2021), stakeholder management (Fobbe and Hilletoft, 2021) or sustainable marketing (Amir and Prabawani, 2023) are key for the success of SBMI. The second part of the business ecosystem refers to the creation of at least one particular ‘ecosystem’ representing an “alignment structure of the multilateral set of partners that need to interact in order for a focal value proposition to materialize” (Adner, 2017, p. 40). The latter is a micro view of the ecosystem, characterized by an alignment structure, multilateral relationships between partners, expectations and an explicit or tacit value proposition. In this vein, Astorino et al. (2025) argue that in SBMI contexts, the collaborative nature of innovation involving multiple interconnected actors renders business models and business ecosystems mutually constitutive. Accordingly, business ecosystems raise new challenges in terms of organizational design (Ganco et al., 2020), leadership (Foss et al., 2023) and external strategies (Adner, 2017) which are addressed in this manuscript.

The findings highlight the importance of relational leadership capabilities for strategic sustainability, and the need to renew dynamic capabilities theory to incorporate the specificities of SBMI. Consequently, this manuscript makes significant theoretical contributions by renewing dynamic capabilities theory, introducing a new capability of ‘projection’ and integrating relational leadership capabilities for strategic sustainability. A comprehensive framework representing the whole SBMI process is therefore presented and discussed. Subsequently, the analysis offers valuable institutional and managerial contributions. Lastly, a research agenda is proposed. The remainder of the paper is structured as follows: Section 2 describes the research method, Section 3 discusses the main findings and Section 4 presents the conclusion.

2. Research method

This study relies on the SLR protocol proposed by Denyer and Tranfield (2009) to structure the analysis of the literature. This protocol, which has been extensively mobilized in management and organization studies (e.g. Kasmi et al., 2022; Ho and O’Sullivan, 2018; Xavier et al., 2017), provides a rigorous and transparent framework to synthesize existing knowledge within a clearly defined research scope.

According to Denyer and Tranfield (2009), a SLR is structured around five main stages:

1. Define the research question;
2. Paper localization: identification of databases and definition of search strings;
3. Select and evaluate papers;
4. Analyze and synthesize the selected papers;
5. Present and discuss results.

The first four stages are detailed in the following subsections, while the fifth stage is presented in Sections 3 and 4. Some authors propose a more granular decomposition of the SLR process, placing particular emphasis on the assessment of the quality of selected papers and on the updating of review results over time. In line with Thomé et al. (2016), a detailed quality fit assessment

(Section 2.3) and a research agenda (Section 4.3) have been implemented to ensure the robustness of the selected corpus and the updating or long-term relevance of the review. Throughout the process, particular attention was paid to ensuring the replicability and transparency of the review protocol, as explicitly advocated by Denyer and Tranfield (2009) and Thomé et al. (2016).

2.1. Step 1 - Formulation of the research question

In accordance with SLR protocols, the research question plays a structuring role by defining the scope and orientation of the review (Denyer and Tranfield, 2009). Building on this principle, the present study seeks to address the following research question: how do organizations innovate towards sustainable business models (SBMI)?

2.2. Step 2 – Localization of papers

The literature search was conducted using the Scopus and Web of Science databases. These databases are widely recognized as reference sources for high-quality peer-reviewed academic publications and are frequently mobilized in SLRs (Paul and Criado, 2020). While some studies rely on a single database—such as Scopus or Web of Science alone (e.g. Maucuer and Renaud, 2019; Daniel et al., 2025; Goletsis et al., 2025)—others emphasize the benefits of combining both databases in order to improve coverage and reduce the risk of omitting relevant contributions (Paul and Criado, 2020).

The search strings are combinations of keywords, and their synonyms, which cover the research problem while ensuring a maximum number of papers on the subject. Care should be taken to acknowledge virtual limitations and to avoid including papers outside the scope of the research (Denyer and Tranfield, 2009). Although the complete exhaustiveness of the search terms cannot be guaranteed, the rigor, transparency, and systematic nature of the search process should be ensured (Snyder, 2019). Therefore, keyword selection followed an iterative refinement process (Tranfield et al., 2003) which was completed in October 2023.

The resulting search strings (Table 1) delineated the research field by decomposing the overarching research objective into four interrelated dimensions: investigate the state of the art regarding the organizational practices (G3) supporting innovation (G4) and sustainability (G2) in the perspective of business models or business ecosystems (G1). Importantly, business ecosystems were considered at the same analytical level as business models, as SBMI cannot be meaningfully examined in isolation from the broader ecosystem in which organizations operate (Astorino et al., 2025). As discussed in the introduction, SBMI is inherently collaborative in nature, involving multiple interconnected actors; consequently, business models and business ecosystems are treated as interrelated and mutually constitutive concepts.

2.3. Step 3 – Paper selection and assessment

A transparent selection of articles obviously involves the use of inclusion and exclusion criteria to assess the relevance of the papers to the issue being analyzed (Denyer and Tranfield, 2009). Inclusion and exclusion criteria were designed to ensure the selection of papers dealing directly with the research question. In accordance with the protocol proposed by Denyer and Tranfield (2009), these criteria were developed and refined through an initial pilot search, during which inclusion and exclusion decisions were discussed in order to clarify their application. In line with prior SLRs (e.g. Geissdoerfer et al., 2018; Kraus et al., 2022; Leipziger et al., 2024), the selection was restricted to peer-reviewed journal articles, while books and conference proceedings were not included. In addition, only articles published in English were considered to facilitate the work of our international research team. Exclusion criteria were further applied to delimit the scope of the review and enhance the relevance of the selected corpus. The inclusion and exclusion criteria are described in Table 2.

As emphasized by Briner and Denyer (2012), paper evaluation constitutes a critical stage in SLR. After the removal of duplicates, the search strategy yielded 2368 records, including 1568 articles from Scopus and 800 from Web of Science. The screening process followed a multi-stage procedure commonly adopted in SLRs, with the successive application of inclusion and exclusion criteria at the title and keyword, abstract, and full-text levels (Macpherson and Holt, 2007). The complete review protocol is summarized in Fig. 2. To support the transparency and collaboration, bibliographic management and data extraction were conducted using Zotero and Microsoft Excel in line with Mateo (2020).

To improve the consistency of the selection process, two reviewers first engaged in a think-aloud protocol (Ali and Petersen, 2014), iteratively discussing inclusion and exclusion decisions until a shared understanding of the criteria was achieved. The refined criteria were then applied independently to a common random subset of 20 studies, followed by a discussion to resolve remaining ambiguities. The screening procedure was subsequently extended to a random sample of 100 studies at the title and abstract level. Interrater agreement was assessed using Cohen's kappa statistic, yielding a value of $\kappa = 0.74$, which indicates a substantial level of agreement.

Table 1
Search strings.

G.1	("Business Model*" OR "Business Ecosystem*")
G.2	(sustainab* OR green OR circular* OR regenerat* OR resilience* OR degrowth* OR "corporate social responsibility" OR "eco-innovat*")
G.3	(process* OR practic* OR maturity OR assessment OR evaluat* OR activity OR framework OR tool OR "success factor" OR principle OR approach OR guideline OR indic* OR microfoundation* OR task*)
G.4	(innovat* OR new* OR improv* OR evolv* OR distinctive)

Table 2
Inclusion and exclusion criteria.

Inclusion criteria	Exclusion criteria
1. Studies that deal with business model or business ecosystem	1. Studies that do not consider organizational or managerial practices supporting SBMI
2. Studies that address sustainability	2. Studies that considers operational practices (related to materials, production principles, ...)
3. Studies that address innovation	3. Studies exclusively linked to entrepreneurship
4. Studies that address organizational practices	4. Studies that focus exclusively on a single sector, technology, or product, and whose findings cannot be reasonably generalized to broader organizational or managerial contexts.
5. Conceptual or empirical papers published in a peer-reviewed journal	
6. Papers written in the English language	

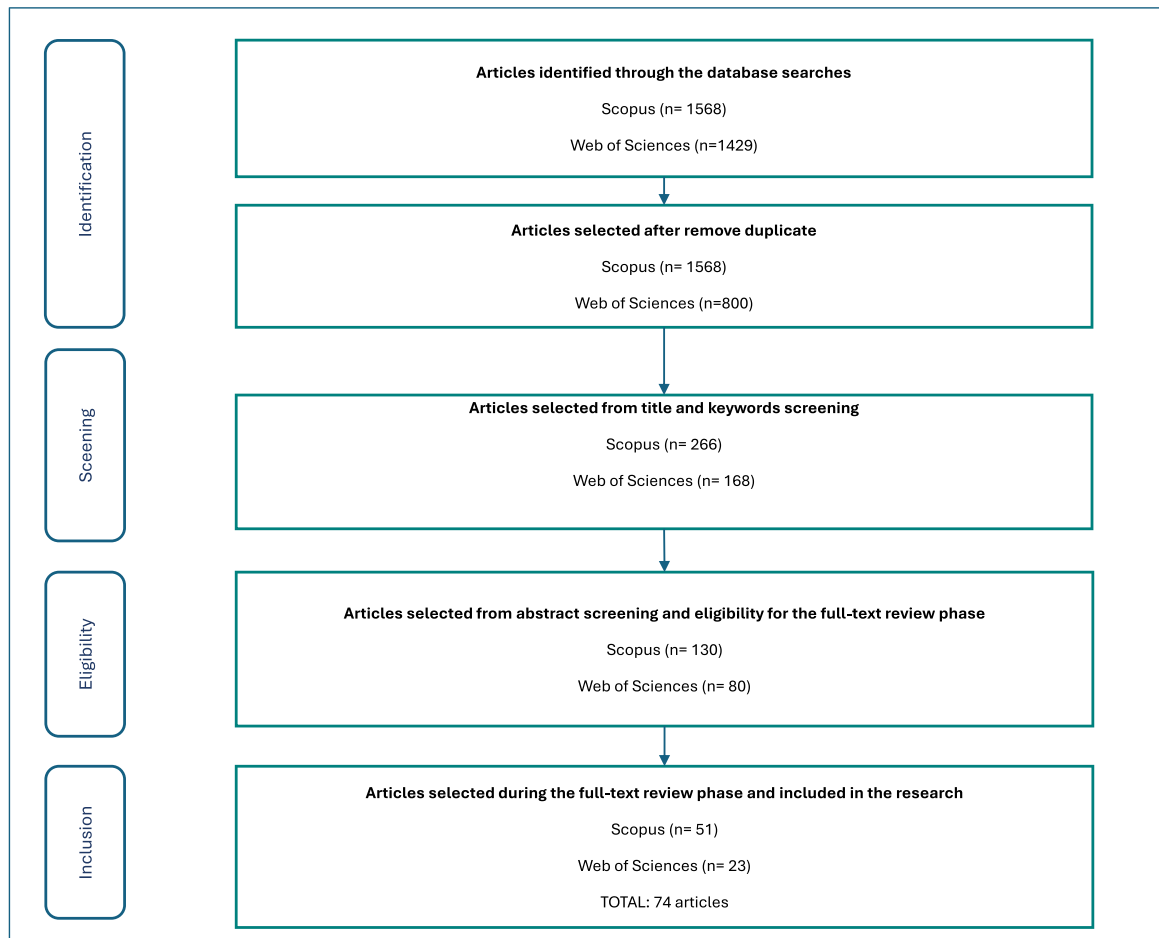


Fig. 2. Systematic literature review process.

The full texts of the remaining articles were then assessed, leading to full consensus between the two reviewers. Two authors were directly involved in the screening process, while the remaining authors contributed through discussion and arbitration. In addition to the screening fit, a robustness check was conducted to assess the quality of the publication outlets. Consistent with prior SLRs (e.g. Kraus et al., 2022; Leipziger et al., 2024; Islam et al., 2025), journal quality was evaluated using established benchmarks (VHB JOURQUAL $\geq$ C, ABS $\geq$ 2, or JCR $\geq$ 1.5). This ex post assessment indicates that 98.6% of the reviewed articles were published in journals meeting at least one of these thresholds, supporting the overall robustness of the corpus.

2.4. Step 4 – Analysis and synthesis of selected papers

After the paper selection, the data were analyzed and synthesized in order to propose transversal conclusions. The reading process was carried out through an analysis grid in Microsoft Excel allowing to extract important information concerning the microfoundations

of SBMI. Using our analysis grid, we first collected descriptive data on the articles, such as the date and source of publication, the method and research design, and the main subject. We then analyzed the articles using various criteria arising from the research question: relevant textual and graphical elements that provided insights into the phasing and sequencing of SBMI, the theories mobilized and the supporting practices and activities in SBMI. For this latter point, we constructed, for each article, an index of key organizational and managerial activities and practices identified in the literature as underpinning SBMI. A worked example illustrating this coding procedure is provided in Appendix A. Each co-author worked independently in a first step in order to reduce the possibility of bias and the results were then discussed in joint sessions. The final results were therefore defined according to an inductive approach (Seuring and Gold, 2012).

3. Results

This section highlights the key components of SBMI. As defined in the introduction section, SBMI is a process of innovation that involves transforming an existing business model or creating a new one (e.g. Minatogawa et al., 2022; Ringvold et al., 2022; Shakeel et al., 2020). This process integrates various types of innovation to reshape how an organization and its value network create, deliver, and capture value, ultimately creating positive socio-ecological implications and/or reducing negative environmental and social impacts (Bocken et al., 2014; Geissdoerfer et al., 2018). Such innovation requires the development of dynamic capabilities (3.1) as well as relational leadership capabilities (3.3). These are rooted in a series of organizational microfoundations (3.2).

3.1. SBMI as a dynamic process

The theory of dynamic capabilities is by far the most widely used theoretical framework in the articles analyzed. This theory extends the traditional view of the resource-based firm (Barney, 1991) to the realm of dynamic environmental contexts, where change and disruption are the norm rather than the exception. Dynamic capabilities are a set of strategic activities aimed at enabling companies to integrate, build, and reconfigure internal and external resources to address, and possibly shape, rapidly changing business environments (Teece et al., 1997). Dynamic capabilities refer to specific strategic organizational processes and routines that create value for firms within dynamic markets by manipulating resources into new value-creating strategies (Eisenhardt and Martin, 2000). The concept of dynamic capabilities was developed in an attempt to provide an umbrella framework integrating strategy and innovation literature with a focus on multi-national businesses (Teece, 2007).

The lack of dynamic capabilities could explain the timidity of most sustainability strategies. Bringing innovation and sustainable development together offers the prospect of breakthrough innovations that radically alter a company's offering or processes. However, the realities on the ground show that the process of transforming the business model is generally a gradual one, built around incremental innovations (Cuénoud et al., 2019; He et al., 2018; Acosta et al., 2014). The scale of the organizational changes required hampers business model transformation (e.g. Amir and Prabawani, 2023; Holtström et al., 2019; Velter et al., 2020), and can be a source of tension (Oskam et al., 2021; Tabares, 2021; Stubbs, 2019). Our results show that, in general, SBMIs are divided into three phases: scanning or building of ideas, conceptualization of SBM, adoption or transformation of SBM. The transition from the first stage to the second is a critical phase during which an assessment of sustainable opportunities is necessary (Averina et al., 2022). Not all sustainable opportunities are worthwhile, and decision-makers need to be able to filter and integrate them. This brings us to a more detailed discussion of the dynamic capabilities required by SBMI.

Teece (2007, p1319) explicates that dynamic capabilities can be disaggregated into the ability “(1) to sense and shape opportunities and threats, (2) to seize opportunities, and (3) to maintain competitiveness through enhancing, combining, protecting, and, when necessary, reconfiguring the firm's intangible and tangible assets”. According to Feiler and Teece (2014), *sensing* involves gaining knowledge about competitors, exploring technological opportunities, probing markets, listening to customers or suppliers, along with scanning and exploring other elements of the business ecosystem (partners, joint ventures, government regulators, etc.). This capability helps firms to identify possible future development paths. *Seizing* aims to translate the opportunities into a promising product or process (Lieberherr and Truffer, 2015), and involves mobilizing and inspiring the organization to develop organizational and business ecosystem readiness to capture the knowledge and use it to commercial ends (Feiler and Teece, 2014). *Seizing* capability refers to the specific actions aimed at developing a strategy, redesigning the business model, and identifying a governance structure in order to pursue newly sensed opportunities (Teece, 2007). *Reconfiguring* allows firms to reconfigure internal and external resources in order to address newly sensed opportunities (Teece et al., 1997). Reconfiguration could deal with several dimensions and resources of the firms, such as human resources, technologies, assets structure, and operations for the development of new products or processes (Teece, 2007).

The articles selected identify the organizational processes driving SBMI. However, the articles based on dynamic capabilities theory go further and link the organizational processes driving SBMI to different dynamic capabilities. These discuss microfoundations, a concept provided by Teece (2007), for understanding the micro-level constructs that facilitate the development of dynamic capabilities. Put differently, microfoundations reflect the individual-level and group activities that not only contribute to the development of dynamic capabilities but also impact the overall strategy of an organization (Fallon-Byrne and Harney, 2017). Therefore, microfoundations of dynamic capabilities comprise all the processes, procedures, structures, organizational activities or skills underlying each capability and influencing its sensing, seizing and reconfiguring capacities. The packages of microfoundations for dynamic capabilities can be traced in the innovation trajectory of a firm (Teece, 2007).

As detailed in the next section, this concept of *microfoundation* is the most appropriate for explaining the SBM building process. Nevertheless, it appears that a new dynamic capability is needed to frame all SBMIs. Several microfoundations could not be directly

linked to the sensing, seizing and reconfiguring capabilities. These microfoundations pointed instead to a distinct ‘projection’ capability, defined as the organization’s ability to evaluate innovations during SBMI and project them into other environments so that the benefits, from a sustainable point of view, could be multiplied. When an organization which has piloted SBMI seeks to enable its implementation in other places or in other contexts, while avoiding potentially perverse rebound effects, it relies on its projection capability. This capability therefore encompasses a systemic assessment of SBMI outcomes, including potential rebound or unintended effects, as well as strategic decisions regarding the appropriate forms of diffusion (e.g., replication, scaling, knowledge sharing, or partnership-based dissemination). Importantly, projection also includes the deliberate decision not to diffuse a given SBMI when the risk of perverse rebound effects or context-specific misalignment outweighs the expected socio-ecological benefits. This projection capability is intentional and not market-driven, it originates from the intention to contribute more broadly to the sustainable transition, although it may yield positive effects on competitiveness (e.g., financial gains, knowledge acquisition, or partnerships). Finally, this capability can encompass innovations such as organizational processes, business models, knowledge development, and technological advancements. This new capability is essential to accelerate the global shift towards sustainability and is consistent with the definition of Teece et al. (1997, pp 515): “the term ‘dynamic’ refers capacity to renew competences so as to achieve congruence with the changing business environment”.

3.2. Microfoundations of SBMI

We have been able to identify microfoundations at three levels. Firstly, there are microfoundations internal to the organization that are specific to the culture, structure, strategy and other elements of internal management. Secondly, externally oriented microfoundations are linked to the way in which the organization interacts with the external environment, in particular through collaborative operations with stakeholders, marketing operations or open innovation processes. Finally, the last level of analysis corresponds to the microfoundations related to the orchestration of the ecosystem. Indeed, the ecosystem is a whole structure in itself, with its own culture, strategies, *modus operandi*, and so on. In this section, we will debate the microfoundations of dynamic capabilities for SBMI, while the interconnections with relational leadership capabilities will be discussed in Section 3.3. Tables 3–5 below illustrate respectively the internal, external and ecosystem microfoundations identified, as well as their related capabilities and references.

3.2.1. Internal microfoundations

‘Sustainable culture of continuous improvement’ and ‘Collaborative intelligence’ are the microfoundation categories related to sensing capability. Organizations should have in-depth knowledge of the territory and organizational context, seeking to better understand its own environment and identify sustainable opportunities. The sustainable culture of continuous improvement also requires a systemic perspective to understand how the company’s activities and, more broadly, the system are interconnected. The role of top management is to broaden the scope of perception and question employees about their activities, taking into account the whole system in which they occur. The culture should also be creative, encouraging trial-and-error and a do-it-yourself attitude. Managers motivate employees to share their ideas and concerns, and monitor and evaluate them. Through an “out-of-the box” R&D processes, organizations seek to discover and integrate new knowledge related to the management of socio-ecological issues. One possible way is to create a “rehearsal laboratory”, decoupled from the core business, where there are no restrictions on freedom of thought. For collaborative intelligence, organizations should plan collaborative monitoring with internal and external collaborators to get a better picture of what is going on within the organization and outside it. Finally, organizations need to incorporate reflective practices around pressures and expectations. All these activities promote organizational ambidexterity: being able to develop other ideas and business models while carrying out business as usual.

‘Defining an SBM’, ‘Defining success principles’, ‘Defining operating principles’ and ‘Validation process’ are the microfoundation categories of seizing capability. First of all, the three dimensions of sustainable development are integrated at the heart of SBM, strategic planning and innovation processes. This integration is transversal within the organization, and not in a silo logic. Therefore, the organization’s *raison d’être* or vision is strong and forms the basis of a narrative leadership structure. The backcasting approach is appropriate to define vision-based objectives that will guide both long- and short-term investments. A common language around sustainability, using accepted sustainability frameworks (ODD, FSSD, Doughnut Economics, Cradle-to-Cradle, biomimicry, etc.), helps to define an SBM. Defining such a business model also requires cooperation, so leaders search for synergies within the system. Secondly, the perception of success is based on sustainability criteria, derived from the shared vision. From vision-based success, the pursuit of financial profit must be seen as a means of fulfilling the company’s missions. In highly sustainable organizations, maximizing financial gain or the quest for growth are not primary objectives. Organizations must develop short-, medium- and long-term performance management indicators to track social and environmental profit as well as economic profit (tri-profit). It is on this basis that the company can see whether it is on the right or wrong track to achieving the success it has collectively imagined. To adapt the performance management system to sustainable objectives, both qualitative and quantitative measures are needed. Thirdly, operating principles take into account the entire life cycle of the solution to bring positive changes to the system as a whole. The use of eco-design tools should be systematic in product development processes. Internal collaboration is another operating principle, cross-functional work and communication between all members of the organization are essential for SBMI. Lastly, tasks need to be validated at the operational level through single- (“are we performing our tasks correctly?”) and double-loop (“is this the right thing to do in light of our vision?”) learning. Managers should offer time and space to “slow down”, question and validate any evolutions of the business model.

‘Organizational governance model’, ‘Human organizational change’, ‘Adapting HR practices’, ‘Adapting innovation teams’ and ‘Structured approach towards operational decisions’ are the microfoundation categories of reconfiguration capability. A first step for sustainable business is to set up multidisciplinary (e.g. biologist, economist, sociologist, etc.) and structured strategic decision-making

Table 3
Internal microfoundations of SBMI process.

Microfoundation categories	Microfoundations	Relational leadership capabilities	References
SENSING Sustainable culture of continuous improvement	In-depth knowledge of the territory and organizational context	IT	Bhardwaj et al. (2022); Breuer et al. (2018); Elf et al. (2022); Holtström et al. (2019); Levänen et al. (2022); Ringvold et al. (2022); Sabella and Eid (2016); Santa-Maria et al. (2022); Tabares (2021)
	Systemic perspective	IT	Atif (2023); Breuer et al. (2018); Hofmann, zu Knyphausen- Aufseß (2022); Holtström et al. (2019); Kristensen et al. (2021); Kurucz et al. (2017); Mousavi and Bossink (2017); Pieroni et al. (2021); Ringvold et al. (2022); Santa-Maria et al. (2022); Schlüter et al. (2023); Sinha (2022); Spieth et al. (2019); Throop and Mayberry (2017); Upward and Jones (2016)
	Creative culture	CP DSV	Bocken and Geradts (2020); Dentoni et al. (2021); Elf et al. (2022); Hofmann and Jaeger-Erben (2020); Hofmann, zu Knyphausen- Aufseß (2022); Khan et al. (2020); Kurucz et al. (2017); Kuzma and Sehnem (2021); Levänen et al. (2022); Marrucci et al. (2022); Pedersen et al. (2018); Ringvold et al. (2022); Roome and Louche (2016); Santa-Maria et al. (2022); Scarpellini et al. (2020); Sehnem et al. (2019)
	"Out of the box" R&D	CP DSV	Hofmann, zu Knyphausen- Aufseß (2022); Bocken and Geradts (2020); Dentoni et al. (2021); Hofmann and Jaeger-Erben (2020); Inigo et al. (2017); Kasmí et al. (2022); Khan et al. (2020)
Collaborative intelligence	Collaborative monitoring	DSV	Sinatoko Djibo et al. (2023); Kennedy et al. (2017); Madsen (2020); Marrucci et al. (2022); Seles et al. (2022)
	Reflection on pressures and expectations	DSV	Zollo et al. (2013)
SEIZING Defining an SBM	Integrating the three dimensions of sustainable development	STSB	Bocken and Geradts (2020); Breuer et al. (2018); Hofmann and Jaeger-Erben (2020); Khan et al. (2020); Madsen (2020); Pedersen et al. (2018); Ringvold et al. (2022); Santa-Maria et al. (2022); Sehnem et al. (2019); Stubbs (2019); Tabares (2021); Teixeira and Junior (2019)
	Raison d'être	STSB	Breuer et al. (2018); Ciasullo et al. (2019); Van Eechoud and Ganzaroli (2023); Hofmann and Jaeger-Erben (2020); Hofmann, zu Knyphausen- Aufseß (2022); Madsen (2020); Marrucci et al. (2022); Roome and Louche (2016); Spieth et al. (2019); Teixeira and Junior (2019); Zollo et al. (2013)
	Vision-based objectives	STSB	Breuer et al. (2018); Bocken and Geradts (2020); Hofmann and Jaeger-Erben (2020); Hofmann, zu Knyphausen- Aufseß (2022); Kennedy et al. (2017); Kurucz et al. (2017); Ringvold et al. (2022); Schlüter et al. (2023); Stubbs (2019); Tabares (2021)
	Common language	STSB	Broman and Robèrt (2022); Madsen (2020); Ringvold et al. (2022); Santa-Maria et al. (2022)
Defining success principles	Search for synergies	STSB	Kurucz et al. (2017)
	Vision-based success	STSQ	Elf et al. (2022); Hofmann and Jaeger-Erben (2020); Kristensen et al. (2021); Sabella and Eid (2016); Sehnem et al. (2019); Spieth et al. (2019); Stubbs (2019); Tabares (2021); Teixeira and Junior (2019); Troise et al. (2023); Upward and Jones (2016)
	Performance management system adapted to objectives	STSQ	Bocken and Geradts (2020); Breuer et al. (2018); Cabral and Gohr (2023); Hofmann and Jaeger-Erben (2020); Hofmann, zu Knyphausen- Aufseß (2022); Kristensen et al. (2021); Oliveira-Dias et al. (2022); Pedersen et al. (2018); Pieroni et al. (2021); Ringvold et al. (2022); Santa-Maria et al. (2022); Scarpellini et al. (2020); Sehnem et al., (2019); Stubbs (2019); Tabares (2021); Teixeira and Junior (2019); Upward and Jones (2016)
Defining operating principles	Eco-design	STSQ	Bocken and Short (2021); Breard and Llorente-González (2022); Breuer et al. (2018); Khan et al. (2020); Kristensen et al. (2021); Kuzma and Sehnem (2021); Marrucci et al. (2022); Mousavi and Bossink (2017); Santa-Maria et al. (2022); Schlüter et al. (2023); Tabares (2021); Throop and Mayberry (2017)
	Internal collaboration	STSQ	Bocken and Geradts (2020); Ciasullo et al. (2019); Hofmann and Jaeger-Erben (2020); Kristensen et al. (2021); Oliveira-Dias et al. (2022); Pieroni et al. (2021); Ringvold et al. (2022); Santa-Maria et al. (2022); Teixeira and Junior (2019)
Validation process	Task validation	STSQ	Kurucz et al. (2017)
	Validation of Business Model evolutions	STSQ	Ringvold et al. (2022)
RECONFIGURATION			

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Table 3 (continued)

Microfoundation categories	Microfoundations	Relational leadership capabilities	References
Organizational governance	Structured, multidisciplinary board	SUSB	Kurucz et al. (2017); Stubbs (2019)
	Ensuring that vision, mission and values are firmly rooted	SUSB	Stubbs (2019)
Human Organizational Change	External advisory board	SUSB	Hofmann and Jaeger-Erben (2020)
	Planning and supporting organizational change.	SUSB	Van Eechoud and Ganzaroli (2023); Hofmann and Jaeger-Erben (2020); Pieroni et al. (2021); Santa-Maria et al. (2022); Rey-Garcia et al. (2021); Roome and Louche (2016); Hofmann, zu Knyphausen-Aufseß (2022)
Adapting HR practices	Transformational leadership	SUSB	Inigo et al. (2017); Kurucz et al. (2017); Madsen (2020); Oliveira-Dias et al. (2022); Sabella and Eid (2016); Throop and Mayberry (2017); Zucchella and Previtali (2019)
	Participative value change processes	SUSB	Hofmann and Jaeger-Erben (2020); Zollo et al. (2013)
	Recruiting staff who share the sustainable vision	SUSQ	Bocken and Geradts (2020); Khan et al. (2020); Marrucci et al. (2022); Scarpellini et al. (2020); Stubbs (2019)
	Training	SUSQ	Bocken and Geradts (2020); Breuer et al. (2018); Ciasullo et al. (2019); Hofmann, zu Knyphausen-Aufseß (2022); Khan et al. (2020); Kuzma and Sehnem (2021); Marrucci et al. (2022); Martinez (2022); Pieroni et al. (2021); Roome and Louche (2016); Santa-Maria et al. (2022); Sehnem et al. (2019); Stubbs (2019); Scarpellini et al. (2020); Seles et al. (2022); Teixeira and Junior (2019); Troise et al. (2023)
Adapting innovation teams	Promoting sustainable initiatives	SUSQ	Bocken and Geradts (2020); Kristensen et al. (2021); Ringvold et al. (2022); Sehnem et al. (2019)
	Employee motivation	SUSQ	Hofmann, zu Knyphausen-Aufseß (2022); Ringvold et al. (2022); Teixeira and Junior (2019)
	Interdisciplinary teams	SUSQ	Elf et al. (2022); Hofmann and Jaeger-Erben (2020); Oliveira-Dias et al. (2022); Pieroni et al. (2021); Ringvold et al. (2022); Santa-Maria et al. (2022); Seles et al. (2022); Throop and Mayberry (2017)
	Small, specialized and autonomous teams	SUSQ	Bhardwaj et al. (2022); Van Eechoud and Ganzaroli (2023); Kuzma and Sehnem (2021); Roome and Louche (2016)
Structured approach to operational decisions	Adaptation of visuals	SUSQ	Roome and Louche (2016)
	Recognition of different profiles	SUSQ	Hofmann and Jaeger-Erben (2020)
	Compliance with values	SUSQ	Stubbs (2019)
	Virtues of frugality and adaptability	SUSQ	Bocken and Geradts (2020); Hofmann, zu Knyphausen-Aufseß (2022); Sinha (2022); Throop and Mayberry (2017)
PROJECTION Measurement system	Supporting role of digital technologies	SUSQ	Hofmann, zu Knyphausen-Aufseß (2022); Kristensen et al. (2021); Oliveira-Dias et al. (2022); Troise et al. (2023)
	Management system audit	COE	Sehnem et al. (2019)
	Assessment of destroyed or missed value	COE	Breuer et al. (2018)
	Multidimensional assessment	COE	Breuer et al. (2018); Tabares (2021); Upward and Jones (2016)
	Assessment of resources and capabilities	COE	Ringvold et al. (2022); Santa-Maria et al. (2022)

Caption: IT=Integrative Thinking, CP=Co-Production, DSV=Dialogic Strategic Visioning, STSB=Strategic System Building, STSQ=Strategic System Quality, SUSB= Supporting System Building, SUSQ=Supporting System Quality, COE=Co-evaluation.

bodies. Also, a committee could aim to ensure that vision, mission and values are firmly rooted, and an external advisory board could act as a driving force behind the socio-ecological transition. Nevertheless, organizational change is highly complex, it needs to be prepared, planned and supported. Employees may have to "unlearn" and "relearn" certain routines. Sustainable organizations rely on transformational leadership, leaders inspire employees with vision, stimulate them intellectually and engage with them emotionally. SBMI requires participative value change processes, in which hierarchy sends signals but does not impose changes, and leaves freedom and time to people. As part of HR practices, sustainable organizations recruit staff who share the sustainable vision and ensure that they develop the appropriate skills. Complexity of socio-ecological issues, potential internal beliefs and the need for openness and training need to be recognized. The next step is to promote sustainable initiatives within the organization. Employee motivation is a key lever for SBMI and needs to be a priority in human resources policy. After adapting HR practices comes adapting innovation teams. Innovation teams are preferably interdisciplinary so that they can address technical, financial, usage and sustainability issues, and should be small, specialized and autonomous to facilitate the development of socio-ecological knowledge. Setting up appropriate personality and role structures can be vital to the successful orchestration of SBMI. The differences in personality profiles need to be recognized leading to coherent role structures. Sustainable organizations also adapt their visuals in order to facilitate communication between teams. Furthermore, operational decisions are governed by compliance with values. For instance, when selecting a new

Table 4

External microfoundations of SBMI process.

Microfoundation categories	Microfoundations	Relational leadership capabilities	References
SENSING Territorial perspective	Participation in inspiring events	IT	Amir and Prabawani (2023); Ciasullo et al. (2019); Khan et al. (2020); Sehnem et al. (2019); Mousavi and Bossink (2017); Madsen (2020); Marrucci et al. (2022); Roome and Louche (2016)
	Sustainable dialogue with local communities	IT	Cabral and Gohr (2023); Ciasullo et al. (2019); Seles et al. (2022)
	Exploring community needs	CP	Abreu et al. (2021); Averina et al. (2022); Best et al. (2022); Bhardwaj et al. (2022); Breuer et al. (2018); Cabral and Gohr (2023); Ciasullo et al. (2019); Comin et al. (2020); Van Eechoud and Ganzaroli (2023); Elf et al. (2022); Inigo et al. (2017); Kennedy et al. (2017); Marrucci et al. (2022); Mousavi and Bossink (2017); Oliveira-Dias et al. (2022); Pieroni et al. (2021); Sabella and Eid(2016); Santa-Maria et al. (2022); Seles et al. (2022)
	Extra-sectoral collaboration	DSV	Amir and Prabawani (2023); Köhl et al. (2020); Ciasullo et al. (2019); Dentoni et al. (2021); Kasmi et al. (2022); Khan et al. (2020); Lippolis et al. (2023); Martinez (2022); Marrucci et al. (2022); Oliveira-Dias et al. (2022); Rey-García et al. (2021); Seles et al. (2022)
SEIZING Open eco-innovation	LT commitment with value chain partners	STSB	Abreu et al. (2021); Amir and Prabawani (2023); Bhardwaj et al. (2022); Bocken and Short (2021); Breuer et al. (2018); Cabral and Gohr (2023); Comin et al. (2020); Sinatoko Djibo et al. (2023); Van Eechoud and Ganzaroli (2023); Elf et al. (2022); Engwall et al. (2021); Holtström et al. (2019); Inigo et al. (2017); Kaipainen et al. (2022); Spieth et al. (2019); Teixeira and Junior (2019); Verleye et al. (2024)
	Co-development of strategies	STSB	Averina et al. (2022); Bhardwaj et al. (2022); Breuer et al. (2018); Cabral and Gohr (2023); Ciasullo et al. (2019); Comin et al. (2020); Van Eechoud and Ganzaroli (2023); Elf et al. (2022); Inigo et al. (2017); Kennedy et al. (2017); Marrucci et al. (2022); Mousavi and Bossink (2017); Oliveira-Dias et al. (2022); Pieroni et al. (2021); Santa-Maria et al. (2022); Seles et al. (2022)
	Sustainable marketing practices	STSB	Amir and Prabawani (2023); Bhardwaj et al. (2022); Cabral and Gohr (2023); Ciasullo et al. (2019); Van Eechoud and Ganzaroli (2023); Elf et al. (2022); Oliveira-Dias et al. (2022); Sabella and Eid(2016); Seles et al. (2022); Stubbs (2019); Tabares (2021)
	Engaging customers in a sustainable community	STSB	Cabral and Gohr (2023); Ciasullo et al. (2019); Hofmann, zu Knyphausen- Aufseß (2022); Holtström et al. (2019); Levänen et al. (2022); Spieth et al. (2019)
Defining a sustainable marketing strategy	Definition of revenue policy	STSQ	Hofmann, zu Knyphausen- Aufseß (2022); Kristensen et al. (2021); Kuzma and Sehnem (2021); Mousavi and Bossink (2017); Spieth et al. (2019)
	Co-production with stakeholders	SUSB	Atif (2023); Bhardwaj et al. (2022); Bocken and Geradts (2020); Breuer et al. (2018); Comin et al. (2020); Kristensen et al. (2021); Martinez (2022); Mousavi and Bossink (2017); Oliveira-Dias et al. (2022); Santa-Maria et al. (2022); Sehnem et al. (2019); Seles et al. (2022); Spieth et al. (2019); Teixeira and Junior (2019); Troise et al. (2023)
	Deconstruction of cognitive biases linked to the sustainable offer	SUSB	Abreu et al. (2021); Cabral and Gohr (2023); Holtström et al. (2019); Verleye et al. (2024)
	Adapting visuals	SUSQ	Roome and Louche (2016)
RECONFIGURATION Operationalization of collaborative activities	Cross-functional innovation teams	SUSQ	Van Eechoud and Ganzaroli (2023); Engwall et al. (2021); Kristensen et al. (2021); Mousavi and Bossink (2017); Parida et al. (2019)
	Joint learning and training	SUSQ	Comin et al. (2020); Sinatoko Djibo et al. (2023); Oliveira-Dias et al. (2022)
	Monitoring of collaborative activities	COE	Cabral and Gohr (2023)
	Transparent and sustainable reporting	COE	Kristensen et al. (2021); Pedersen et al. (2018); Santa-Maria et al. (2022); Scarpellini et al. (2020); Sehnem et al. (2019)
Societal legitimacy	Projecting with stakeholders	RT	Sabella and Eid (2016)

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Table 4 (continued)

Microfoundation categories	Microfoundations	Relational leadership capabilities	References
	Educational role of users	RT	Atif (2023); Bhardwaj et al. (2022); Bocken and Short (2021); Cabral and Gohr (2023); Elf et al. (2022); Foroozanfar et al. (2022); Inigo et al. (2017); Kuzma and Sehnem (2021); Verleye et al. (2024)
	Sector leadership	RT	Abreu et al. (2021); Best et al. (2022); Engwall et al. (2021); Holtström et al. (2019); Inigo et al. (2017); Kaipainen et al. (2022); Kennedy et al. (2017); Mousavi and Bossink (2017); Oliveira-Dias et al. (2022); Spieth et al. (2019); Tabares (2021); Troise et al. (2023); Verleye et al. (2024)
	Corporate activism	RT	Amir and Prabawani (2023); Ciasullo et al. (2019); Khan et al. (2020); Madsen (2020); Marrucci et al. (2022); Mousavi and Bossink (2017); Roome and Louche (2016); Sehnem et al. (2019); Tabares (2021)

Caption: IT=Integrative Thinking, CP=Co-Production, DSV=Dialogic Strategic Visioning, STSB=Strategic System Building, STSQ=Strategic System Quality, SUSB=Supporting System Building, SUSQ=Supporting System Quality, COE=Co-evaluation, RT=Reproductive thinking.

partner, sustainable organizations ensure that this partner matches the organization's values. Virtues of frugality and adaptability drive sustainable operational decisions. First, it is necessary to replace the "more is better" logic by one of "doing better with less". In doing so, the organization seeks to be agile, creative and courageous in order to promote its resilience. Finally, digital technologies play a supporting role in the SBMI process. Organizations can leverage digital technologies and artificial intelligence (e.g. production process management, lifecycle management, etc.) to support the socio-ecological strategy.

'Measurement system' is the only microfoundation category that has been identified for projection capability. As part of a reflective and continuous improvement approach, sustainable businesses periodically audit their management system covering societal aspects. Similarly, organizations must assess the value they destroy or miss, thereby highlighting opportunities for development. A highly sustainable organization is able to define and measure profit, with its stakeholders, using a multidimensional assessment method in line with the three dimensions of sustainability. Finally, tangible and intangible resources, as well as organizational capabilities, should be assessed periodically, and projects can be prioritized according to their suitability in relation to the strengths present.

3.2.2. External microfoundations

'Territorial perspective' and 'Collaborative opportunities' are the microfoundation categories related to external sensing capability. First of all, organizations develop their exchange networks, in particular by taking part in inspiring events (e.g. conferences, workshops, communities of practice, trade fairs, etc.). Having sustainable dialogue with local communities is another way to be inspired. In that perspective, organizations seek to promote the sustainable development of the territory in which they operate. Dialogue is therefore established with local institutions, bodies and associations, and there is a reflection on the location of partners operating within the value chain. Second, sustainable organizations explore community needs to sense the values and beliefs of their target groups regarding appropriate social and business conduct. Hence, SBMI is usually open, and potential users are rapidly involved in the process. Furthermore, extra-sectoral collaboration, with organizations that do not operate directly in areas linked to financial performance, is often needed to enhance knowledge basis.

The two microfoundation categories that have been identified for seizing capability are 'Open eco-innovation' and 'Defining a sustainable marketing strategy'. For a sustainable development, many organizations are committed to long-term relations along the value chain. The resulting open innovation process allows the co-development of strategies. Indeed, sustainable marketing practices are carried out to show the "points of difference" between the organization and traditional practices in the sector. Communication is holistic, with the organization offering a story and not just a low-cost or good-quality product. However, conventional marketing practices and digital tools are key to supporting community involvement, especially the use of social networks. Engaging customers in a sustainable community means that they adhere to the values and ideas of the organization before they adhere to products or services. Finally, organizations need to define a revenue policy in line with their sustainable commitment. Unconventional marketing practices are used, such as transparency, fair trade or fair wage.

'Operationalization of collaborative activities' is the only microfoundation category related to external reconfiguration capability. Various forms of dialogue and interactions, in a spirit of co-production with stakeholders, need to be put in place. The focus on interactions between stakeholders must shift from "doing the right things for them" to "doing the right things with them". Through these interactions, the organization tries to deconstruct cognitive biases linked to the sustainable offer. Indeed, some myths are associated with sustainable offer (e.g. inferior quality). To facilitate communication, a common language around sustainability is developed and the visuals are adapted. Moreover, sustainable entities conduct innovation experiments with their partners. Therefore, the various partners in the value chain should be represented in cross-functional innovation teams and joint learning and training are organized.

'Evaluation and communication' and 'Societal legitimacy' are the microfoundation categories related to projection capability. First of all, organizations monitor the collaborative activities with stakeholders, in order to assess any shortcomings or successes. Then, sustainable reporting is transparent and based on structured facts. Secondly, projecting new projects with stakeholders helps to maintain their social commitment. Relations with customers are developed throughout the life cycle. Organizations play an

Table 5
Ecosystem microfoundations of SBMI process.

Microfoundation categories	Microfoundations	Relational leadership capabilities	References
SENSING			
Ecosystem culture and belonging	Territorial anchoring	IT	Amir and Prabawani (2023); Dentoni et al. (2021)
	Systemic perspective	ITCP	Schlüter et al. (2023); Verleye et al. (2024)
	Joint-partner learning	CPDSV	Best et al. (2022); Elf et al. (2022); Ferrari et al. (2023); Inigo et al. (2017); Lippolis et al. (2023); Madsen (2020); Parida et al. (2019); Velter et al. (2020); Zucchella and Previtali (2019)
	A culture of trial and error	CPDSV	Oskam et al. (2021)
SEIZING			
Ecosystem co-construction	Developing a shared vision across the ecosystem	STSB	Dentoni et al. (2021); Ferrari et al. (2023); Gomes et al. (2023b); Joo et al. (2016); Konietzko et al. (2020); Oskam et al. (2021); Pies and Schultz (2023); Velter et al. (2020); Verleye et al. (2024); Zucchella and Previtali (2019)
	Resource-sharing activities within the ecosystem	STSB	Levänen et al. (2022); Parida et al. (2019); Velter et al. (2020); Verleye et al. (2024)
	Shared resilience within the ecosystem	STSB	Dentoni et al. (2021); Ferrari et al. (2023); Mousavi and Bossink (2017); Oskam et al. (2021); Verleye et al. (2024)
	Development of shared objectives within the ecosystem	STSB	Best et al. (2022); Kristensen et al. (2021); Konietzko et al. (2020); Madsen (2020); Velter et al. (2020); Verleye et al. (2024)
	Modelling and mapping the ecosystem	STSBSTSQ	Gomes et al. (2023a); Konietzko et al. (2020); Parida et al. (2019)
Creating value within the ecosystem	Defining a sustainable value creation proposition for the territory	STSQ	Amir and Prabawani (2023); Gomes et al. (2023a); Gomes et al. (2023b); Konietzko et al. (2020); Oskam et al. (2021); Sabella and Eid (2016)
	Facilitating customer commitment within the ecosystem	STSQ	Averina et al. (2022); Best et al. (2022); Joo et al. (2016); Konietzko et al. (2020)
	Sharing the value created by the ecosystem	STSQ	Averina et al. (2022); Iizuka and Hane (2021); Joo et al. (2016); Konietzko et al. (2020); Oskam et al. (2021); Parida et al. (2019)
	Setting a common strategy that creates value for the ecosystem	STSQ	Best et al. (2022); Konietzko et al. (2020); Kristensen et al. (2021); Madsen (2020); Velter et al. (2020); Verleye et al. (2024)
Ecosystem partners	Inclusive decision-making	STSQ	Dentoni et al. (2021)
	Open ecosystem	STSQ	Konietzko et al. (2020); Oskam et al. (2021); Parida et al. (2019); Verleye et al. (2024)
	External expertise	STSQ	Dentoni et al. (2021); Konietzko et al. (2020); Oskam et al. (2021); Amir and Prabawani (2023); Ferrari et al. (2023)
RECONFIGURATION			
Ecosystem governance	Group cohesion and role definition	SUSB	Amir and Prabawani (2023); Gomes et al. (2023b); Konietzko et al. (2020); Madsen (2020); Oskam et al. (2021)
	Collaborative decentralized governance structure	SUSB	Averina et al. (2022); Gomes et al. (2023b); Konietzko et al. (2020); Zucchella and Previtali (2019)
	Periodic analysis of risks and opportunities	SUSB	Gomes et al. (2023a); Lippolis et al. (2023); Madsen (2020); Parida et al. (2019)
Experiential learning	Tests on a local scale	SUSBSUSQ	Dentoni et al. (2021); Gomes et al. (2023a); Oskam et al. (2021); Velter et al. (2020)
Relationship management	Conflict management	SUSQ	Rey-Garcia et al. (2021)
	Interaction facilitators	SUSQ	Best et al. (2022); Ferrari et al. (2023); Joo et al. (2016); Konietzko et al. (2020); Madsen (2020); Parida et al. (2019); Velter et al. (2020); Verleye et al. (2024)
PROJECTION			
Evaluation	Joint accounting	COE	Best et al. (2022); Dentoni et al. (2021); Kristensen et al. (2021); Verleye et al. (2024)
	Sense-making and sense-giving	COE	Dentoni et al. (2021)
Territorial legitimacy	Ecosystem exemplarity	RT	Amir and Prabawani (2023); Levänen et al. (2022); Zucchella and Previtali (2019)
	Influential player in and for the territory	RT	Amir and Prabawani (2023); Best et al. (2022); Iizuka and Hane (2021); Parida et al. (2019); Pies and Schultz (2023); Verleye et al. (2024)

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educational role for users by supporting the use and experimentation of the offer and encouraging customers to question their consumption. In parallel, organizations exercise sector leadership by collaborating with customers or suppliers to help the sector become more sustainable. Finally, for moral duty reasons, corporate activism toward public authorities is required to develop standards in favor of the socio-ecological transition.

3.2.3. Ecosystem microfoundations

‘Ecosystem culture and belonging’ is the only microfoundation category related to an ecosystem’s sensing capability. A sustainable ecosystem has territorial anchoring, and it addresses issues likely to have a local impact and seeks to serve a specific community. With this in mind, the ecosystem seeks to enhance and institutionalize its involvement with local authorities. Nevertheless, a systemic perspective shared within the ecosystem is required. Ongoing interaction is necessary to share information on customers and feedback on socio-ecological transition best practices. The aim of this joint-partner learning is to build on each other’s experience, work collaboratively, and spread the knowledge acquired. Finally, the ecosystem’s culture encourages trial and error, with experiments distributed and planned over time.

Concerning the ecosystem’s seizing capability, ‘Ecosystem co-construction’, ‘Creating value within the ecosystem’ and ‘Ecosystem partners’ are the microfoundation categories. First of all, the actors need to develop a shared vision across the ecosystem. In this perspective, individual interests must be understood in order to align the shared vision accordingly. The ecosystem actors operate according to the principles of the sharing economy; resource-sharing activities are organized. The actors seek to create a shared resilience within the ecosystem based on the resources and capabilities that can be activated in the territory. Obviously, ecosystem actors agree on common objectives and the configuration of the ecosystem need to be modeled. The initial value proposition is tested and the mutual dependencies between the ecosystem players are continuously mapped. Therefore, a crucial step is to define a sustainable value creation proposition for the territory. To do so, the ecosystem promotes customer commitment through two strategies. The participation strategy makes customers feel psychological ownership by getting them to participate and collaborate within the ecosystem. The socialization strategy relies on ongoing interaction through different activities, such as workshop organization and social network management. Furthermore, a key point is to ensure fair and clear sharing of value created among the players involved. To do this, a monitoring of individual investments and rewards should be organized. Now, it is time to set the strategy that creates value for the ecosystem. Partners can set up inclusive decision-making processes that deliberately give a voice to agents with heterogeneous backgrounds, languages and disciplines. To drive SBMI, the ecosystem must remain open to the involvement of new players and to the needs of ad hoc external expertise.

‘Ecosystem governance’, ‘Experiential learning’ and ‘Relationship management’ constitute the microfoundation categories related to an ecosystem’s reconfiguration capability. ‘Group cohesion and role definition’ is the first associated microfoundation. A sustainable ecosystem forms a community of practice with group cohesiveness. A sustainable ecosystem has a clear collaborative decentralized governance structure, in which an orchestrator is elected. The orchestrator’s roles include tasks such as mediation, coaching, moderation, motivation and management of resources. They are also responsible for ensuring that the ecosystem actors periodically take stock of the risks and opportunities by monitoring trends and regulations. As part of experiential learning, distributed experimentation, in which subgroups of agents test ideas at local scales, are encouraged. Differing ideas, visions and motivations can emerge and cause tension, which must be identified and managed through conflict management strategies. Interaction facilitators could help to avoid conflict. Ecosystem actors should rapidly develop infrastructure to enable continuous and coordinated interaction and should encourage the work of “boundary spanners”, who are highly qualified people capable of taking information from one group and presenting it in a relevant way to another group.

‘Evaluation’ and ‘Territorial legitimacy’ are the microfoundation categories related to an ecosystem’s projection capability. Firstly, ecosystem players engage in joint accounting in order to monitor objectives and act accordingly. Furthermore, to evaluate an ecosystem’s SBMI strategy, partners need to engage in deeper reflective processes, outside the established routines that impede more in-depth processes of reflection and paradigm shift. These processes lead to sense-making and sense-giving activities. Second, the actors collaborate with territorial authorities and promote an innovative and collaborative culture. The goal is to create an adequate institutional context for sustainability integration and to reach ecosystem exemplarity. The ecosystem is thus open to sharing experience with players in other territories in order to accelerate the adoption of SBMI and the creation of new ecosystems. In this way, new business models need to be designed with the possibility of evolution and replication in mind. In conclusion, the ecosystem is an influential player in and for the territory and is able to project its experience in other places.

3.3. Relational leadership capabilities for SBMI

The previous tables established the links between microfoundations and relational leadership capabilities through dynamic capabilities. Indeed, leadership emerged as fundamental in our results. Sustainability starts with people, changing mentalities and attitudes (Sabella and Eid, 2016). SBMI requires a leadership style that is sensitive to the individual. In this regard, leaders intellectually and emotionally stimulate employees, empower them to accomplish positive change through big vision, inspiration and a call to action. This leadership style is called “transformational leadership” (e.g. Assmann et al. 2023; Sabella and Eid, 2016; Zucchella and Previtali, 2019) or “visionary leadership” (Amir and Prabawani, 2023) and represents a key determinant of SBMI. For sustainable disruptive changes, an organization needs new dominant virtues, as opposed to competitive ones: frugality, adaptivity, humility, collaboration and system thinking (Throop and Mayberry, 2017). This need for transformational leaders also exists at the ecosystem level, in order to engage partners in the accomplishment of the societal mission (e.g. Averina et al., 2022; Konietzko et al., 2020; Parida et al., 2019).

On this basis, Kurucz et al. (2017) proposed relational leadership capabilities for strategic sustainability. Relational leadership (Uhl-Bien, Ospina, 2012) is an emerging construct in the organizational literature that offers potential to envision how we might navigate the relational tensions which continuously arise from the integration of sustainability in business. It represents a move away from viewing leadership at the individual level, toward understanding leadership as a “collective capacity” (Day, 2000; Drath, 2001) created in the interactions and relationships among people (Uhl-Bien, Ospina, 2012). In this perspective, leadership is not restricted to

hierarchical positions or roles and occurs in relational dynamics throughout the organization (Uhl-Bien, 2006). Kurucz et al. (2017, p192) define *relational leadership for strategic sustainability* as “an ongoing process of meaning making and reflection within a nested system of the biosphere and human society”.

Discussing transformational leadership, we have already referred to the importance of the quality of relationships between co-workers. Collective meaning-making and reflective practices are core to the idea of relational leadership for strategic sustainability, helping to integrate system thinking and complex knowledge. Kurucz et al. (2017) propose five distinct capabilities. *Integrative thinking* is the capability to expand the field of salience and visualize the whole system while working on the parts and searching for creative solutions. *Co-production* is the capability to explore the different worldviews of the various stakeholders, without judgement, and in a spirit of co-production of the principles of success. *Dialogic strategic visioning* is the capability to engage in empathetic and sincere dialogue with stakeholders in order to develop new knowledge and to identify strategic opportunities. *System building focus* is the capability to understand the strategies and actions of others in a context of system relationships in order to develop synergies and define action plans. *System quality focus* aims to ensure that the tools and actions support the sustainability principles defined and enable the strategic objectives to be achieved. The first three capabilities represent the conceptualization of relational leadership. They involve imagining new possibilities that disrupt the status quo. The last two capabilities represent the operationalization of relational leadership, ensuring that synergies are sought between activities and that strategy, tools and actions are aligned.

According to Barreto (2010), if a capability enhances a firm's ability to identify opportunities and threats, make decisions, solve problems, and modify existing resources, then it is referred to as a dynamic capability. Therefore, the first three refer to sensing capability, by stimulating the development of knowledge, the identification of opportunities and by scanning the business ecosystem. The next two refer to the seizing capability, by stimulating the development of a coherent strategy and action plan for integrating

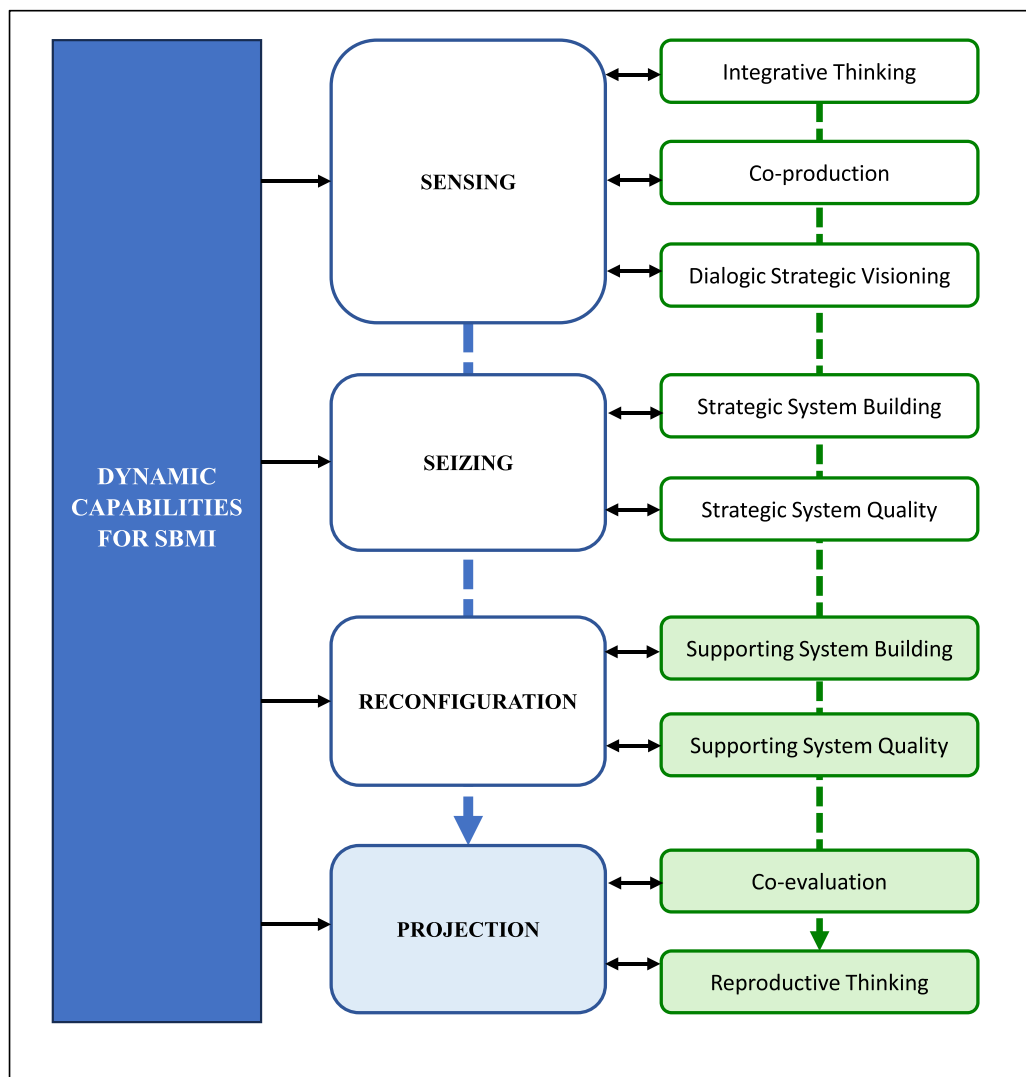


Fig. 3. New dynamic capabilities scheme for SBMI.

opportunities. More specifically, the result tables show that the relational leadership capabilities are subsets of the classic dynamic capabilities. Integrative thinking, co-production and dialogic strategic visioning are thus a subset of sensing, while system building focus and system quality focus are a subset of seizing. The literature does not identify relational leadership capabilities related to reconfiguration and projection capabilities. Drawing on the literature scan, four new relational leadership capabilities have been defined.

Reconfiguration is related to human resources, technologies, assets structure, and operations for the development of innovation, while seizing addresses mainly strategy (Teece, 2007, 2018). In this sense, reconfiguration refers to what we call a “supporting system” used to support the “strategic system” of seizing. Therefore, *supporting system building* is the capability to organize relationships in such a way as to ensure that strategies are successfully implemented. Additionally, *supporting system quality* aims to achieve the proper functioning of the supporting system by ensuring that internal and external relations flow in the right way. Finally, projection can be divided into two relational leadership capabilities. *Co-evaluation* is the capability to explore the different worldviews of the various stakeholders, without judgement, and in a spirit of co-evaluation of the SBMI success. *Reproductive thinking* is the capability to expand the field of salience and visualize the whole system while working on the parts and searching to extend the benefits of SBMI.

4. Discussion and implications

4.1. Theoretical implications: proposing a relational model of dynamic capabilities

This study renews dynamic capabilities theory by integrating recent advances in eco-innovation and sustainability strategy research. Fig. 3 summarizes the proposal and illustrates the specificities of SBMI, made up mainly of intangible microfoundations.

SBMI spans from initial opportunity exploration to subsequent innovation projection, facilitated by an ongoing process of meaning making and reflection, and indicates that sequence matters. Indeed, notwithstanding the potential simultaneous development of the capabilities (Teece, 2007), the results show that they are only useful at specific junctures during SBMI.

Innovation processes are generally divided into three phases: sensing, seizing and reconfiguring. Considering SBMI, it appears that a new dynamic capability is needed to frame the whole process. The projection capability refers to an organization's ability to assess SBMI outcomes and transfer them to other contexts in order to amplify their sustainability benefits. When an organization that has piloted SBMI seeks to enable its implementation in other places or in other contexts, it relies on its projection capability.

More broadly, this capability aligns with the notion of projective responsibility (Aggeri, 2023). From this perspective, organizations are expected to take responsibility not only for the immediate outcomes of their actions, but also for their medium- and long-term socio-ecological consequences. Aggeri (2023) states that projective responsibility relies on two complementary dimensions: eco-design, which integrates sustainability considerations early in innovation processes, including the evaluation of impacts, and the anticipation of scale and systemic effects. Both dimensions require the development of more collaborative and cross-boundary methods. This perspective is particularly salient for disruptive technologies such as artificial intelligence or nanotechnologies, whose impacts are uncertain and systemic, reinforcing the need for anticipatory and projective forms of responsibility.

The process can therefore be divided into four phases: sensing a sustainable opportunity, seizing the opportunity, reconfiguring the organization to exploit the opportunity in the best possible way and, finally, projecting the benefits of SBMI. Subsequently, the investigation exhibits that SBMI requires specific leadership capabilities. At both organizational and ecosystemic levels, strategic sustainability requires collective meaning-making through transformational leadership (e.g. Assmann et al. 2023; Sabella and Eid, 2016; Zucchella and Previtali, 2019) or visionary leadership (Amir and Prabawani, 2023) and reflective practices to integrate system thinking and complex knowledge. These are core to the idea of relational leadership capabilities for strategic sustainability (Kurucz et al., 2017). We contribute to the literature by interconnecting dynamic capabilities theory and relational leadership capabilities for strategic sustainability. As a result, we propose a framework representing the whole SBMI process, composed of the renewed dynamic capabilities and their interconnections with relational leadership capabilities.

Accordingly, the capabilities of integrative thinking, co-production, and dialogic strategic visioning will first enable the identification of opportunities aligned with the needs of each stakeholder. Subsequently, through strategic system building, strategic system quality, as well as supporting system building and supporting system quality, the organization ensures the discovery of synergies to leverage the opportunities, and the alignment of strategies, relationships, and tools in order to transform the opportunity into innovation. Co-evaluation and reproductive thinking will finally guide the relationships to amplify the positive effects of SBMI. As depicted in Fig. 3, when considering SBMI, the innovation process is more complex than the one proposed by Teece (2007). However, the more organizations and their partners develop these dynamic capabilities, the more effectively they can mobilize intangible assets to implement advanced innovations that strengthen performance across the three dimensions of sustainability.

4.2. Practical and policy implications

This research offers managerial and institutional contributions by listing, classifying and integrating the microfoundations of SBMI. Understanding such a process will help practitioners to identify shortcomings in SBMI and help political actors to encourage the development of SBMI in their territories. Firstly, the results underscore the critical role of business ecosystems in enabling SBMI. Organizations are no longer isolated entities. Instead, they must adopt new organizational forms that facilitate openness, collaboration, and adaptability. This shift requires a redefinition of relationships with external actors, including suppliers, competitors, and public authorities, in order to co-create value within a broader ecosystem. Practitioners may materialize such efforts by creating dedicated ecosystem structures and by strengthening collaboration with external partners. For instance, shared data infrastructures,

ecosystem co-development, or joint performance indicators could play a key role in stabilizing inter-organizational collaboration and could help ETM actors to translate sustainability ambitions into concrete governance routines, engineering choices, and coordination practices. Orchestration and long-term governance of ecosystems are needed, and public actors may play a key role in this perspective. Moreover, the effectiveness of ecosystems depends not only on local coordination but also on their integration into broader, trans-national frameworks. In this regard, institutions are well-positioned to facilitate and strengthen supra-national cooperation.

Furthermore, the results encourage organizations to develop distinct dynamic capabilities to support successful SBMI. These capabilities require various forms of managerial innovation, as outlined in the results, which underline the pressing need for government policies to expand education and research on emerging dimensions of sustainability. Public policies can play a decisive role in strengthening the organizational and ecosystem-level capabilities required for SBMI, thereby supporting long-term sustainable transformations. Fig. 4 illustrates the findings by representing SBMI as a transformation process unfolding over a set of interrelated phases, adapted from the cases studied by Roome and Louche (2016).

The process begins with triggering events that place managers in situations of uncertainty and challenge prevailing business logics. These events prompt a progressive awareness that existing products, services, and technologies are embedded in broader socio-technical and ecological systems, requiring new approaches to value creation. As this awareness develops, organizations articulate a sustainability-oriented vision that redefines strategic priorities and legitimizes experimentation beyond established routines. Building on this vision, organizations progressively integrate new concepts into their existing knowledge bases through iterative learning, testing, and adaptation. Implementing SBMI requires the involvement of multiple organizational actors. Senior leaders and CEOs provide strategic direction and legitimacy through purpose-driven and relational leadership. Middle and frontline managers integrate SBMI into operational practices and decision-making. Support functions such as HR and controlling adapt skills development,

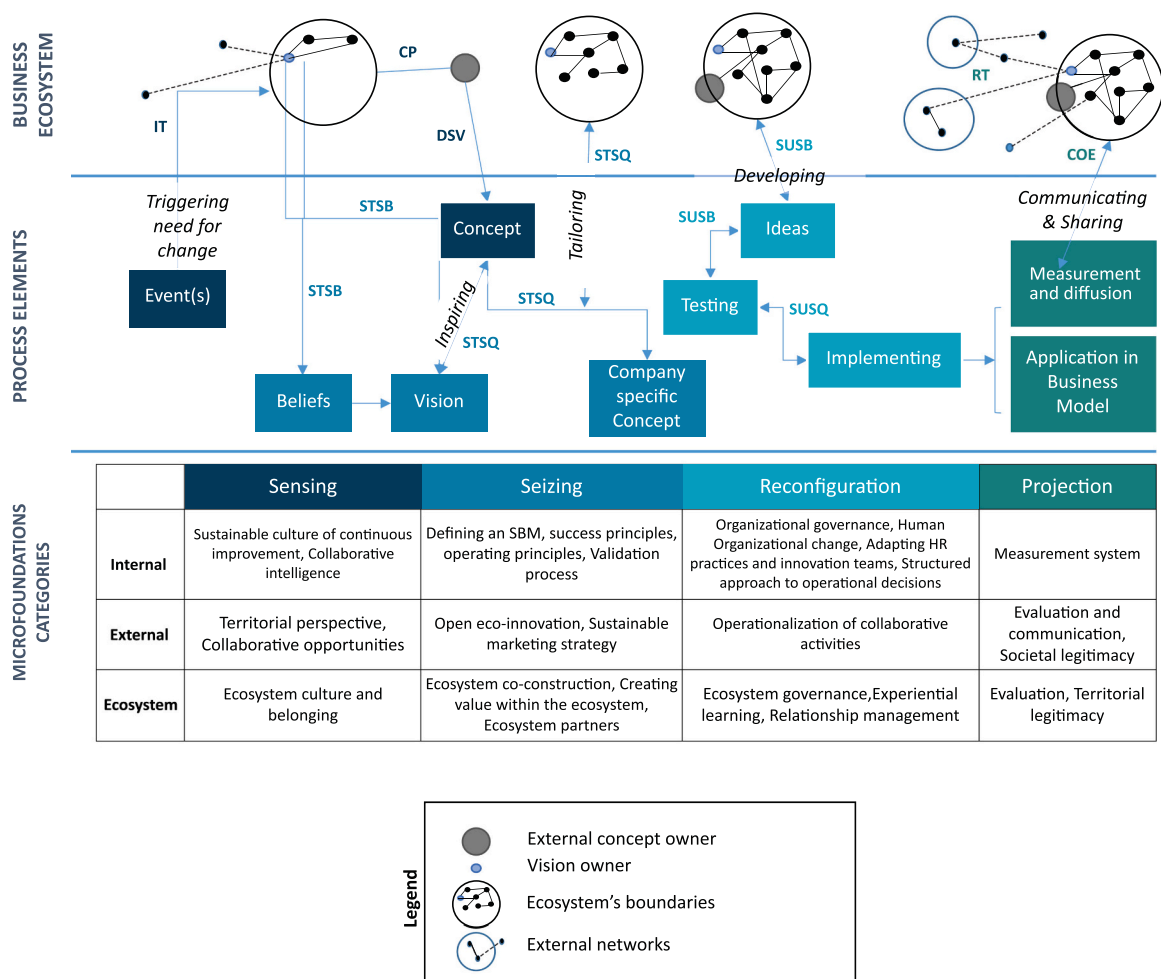


Fig. 4. The Transformation Process of SBMI: Interactions between Organizational Change and Business Ecosystem Evolution IT=Integrative Thinking, CP=Co-Production, DSV=Dialogic Strategic Visioning, STSB=Strategic System Building, STSQ=Strategic System Quality, SUSB=Supporting System Building, SUSQ=Supporting System Quality, COE=Co-evaluation, RT=Reproductive thinking.

Source: Adapted from Roome and Louche (2016)

incentive systems, and performance metrics. Finally, ETM actors (e.g., R&D managers, CTOs, and project leaders) align technology roadmaps, innovation processes, and engineering practices with sustainability objectives.

Beyond internal reconfiguration, organizations develop the ability to evaluate the systemic impacts of their SBMI and to intentionally diffuse positive effects across projects, partners, and territories. This involves new forms of measurement, co-evaluation with ecosystem actors, and the design of replication and scaling mechanisms. By developing projection capability, organizations not only reinforce their own long-term competitiveness, but also contribute to the robustness of their surrounding value chains. SBMI outcomes can be transferred to partners, suppliers, and adjacent industries, thereby reducing systemic vulnerabilities.

4.3. Limitations and avenues for future research on SBMI

Based on the above results, a research agenda is proposed. As illustrated in Table 6 below, the research agenda is articulated around four dimensions that could contribute to a deeper understanding of how organizations can develop and scale SBMI.

First, future research should examine the differentiation and potential clustering of microfoundations across different SBMI types. Not all SBMI profiles necessarily rely on the same microfoundations, which calls for identifying specific configurations, their evolutionary pathways, and the development of more integrative tools and meta-models to support organizations.

Second, Figure 5 highlights the need to further investigate the relationship between dynamic capabilities and relational leadership. This includes understanding how relational leadership capabilities are developed, how they complement and strengthen traditional dynamic capabilities, and how they differ across organizational and ecosystem levels.

Third, the identification of the dynamic capability of projection opens a promising line of inquiry. Future studies should clarify the conditions of its emergence, its degrees of development, and the mechanisms through which it supports diffusion, scaling, and internationalization processes in SBMI.

Fourth, the ecosystem perspective constitutes the fourth key dimension. Greater attention should be paid to ecosystem creation, governance, and roles in SBMI, as well as to their interactions with territorial dynamics and sustainability transitions across local and global scales.

Finally, this research has boundary conditions and limitations, which can also be understood as opportunities for further research. On the one hand, the SLR relied on two databases, whereas incorporating additional sources could expand and enhance the analysis. On the other hand, this study is limited to English papers published in peer-review journals, while using different languages and searching for other empirical studies and books might offer further insights. Lastly, the scope of our study is limited by both the keywords used and the period during which the review was conducted. For instance, related fields such as social business model innovation could provide fresh perspectives on this topic. Moreover, recent technological developments—such as the rapid emergence of generative artificial intelligence—may give rise to new microfoundations for SBMI that are not yet fully captured in the existing literature.

5. Conclusion

This study reviewed literature on SBMI's microfoundations to help managers develop innovation potential aligned with sustainability goals. SBMI processes entail risks (Oskam et al., 2021; Tabares, 2021; Stubbs, 2019) and do not systematically lead to the expected results, putting organizations in tricky positions (Geissdoerfer et al., 2018). The findings suggest that SBMI is based on multitudes of micro-foundations operating at three levels (internal, external and ecosystem) and connecting dynamic capabilities theory with relational leadership capabilities for strategic sustainability. As a result, this study proposes both a conceptual framework and an illustrative transformation process that capture the overall SBMI process through the integration of renewed dynamic capabilities and leadership capabilities. Finally, a research agenda is proposed to support future developments in the field.

CRediT authorship contribution statement

Loann Astorino: Writing – review & editing, Writing – original draft, Validation, Methodology, Investigation, Funding acquisition, Formal analysis, Conceptualization. **Perrine Ferauge:** Writing – review & editing, Writing – original draft, Validation, Supervision, Methodology, Investigation, Funding acquisition, Conceptualization. **Amanda Xavier:** Writing – review & editing, Validation, Supervision, Methodology, Funding acquisition, Conceptualization. **Tharcisio Cotta Fontainha:** Validation, Supervision, Methodology, Funding acquisition.

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Declaration of Competing Interest

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Table 6
Research Agenda for SBMI.

Research Themes	Research Questions	Research Directions
<i>Differentiation and Clustering of Microfoundations</i>	Q1: How do microfoundations vary across different SBMI profiles? Q2: Can clusters of microfoundations be identified, and do they follow specific evolutionary paths? Q3: How can a meta-model support organizations in navigating the wide range of existing transition models?	Investigating the specific microfoundations activated within distinct SBMI profiles through comparative case studies and quantitative analyses could provide deeper insights into SBMI heterogeneity. Examining recurrent combinations of microfoundations may reveal identifiable patterns in sustainable transition processes. Given the abundance of frameworks, developing integrative meta-models could provide conceptual structure and strategic guidance for both researchers and organizations.
<i>Relational Model Of Dynamic Capabilities</i>	Q1: How do relational leadership capabilities manifest across organizational, ecosystem, and external levels? Q2: What role do managers play in developing relational leadership capabilities, and how does this reshape traditional dynamic capabilities? Q3: How can the fundamental microfoundations of relational leadership capabilities be distinguished from those of other dynamic capabilities?	Exploring the contributions and barriers associated with relational leadership capabilities across multiple levels of analysis could clarify their role in SBMI processes. Analyzing managerial practices, organizational learning mechanisms, and governance structures may reveal important differences from traditional dynamic capability models. Clarifying the distinctive microfoundations of relational leadership capabilities could strengthen understanding of their unique contribution to SBMI.
<i>Dynamic Capability of Projection</i>	Q1: How, why, and when do organizations develop projection capabilities? Q2: How does the projection capability operate within a business ecosystem and extend across business ecosystem boundaries?	Investigating the development processes, maturity stages, and contextual variations of projection capabilities, particularly through comparative case studies, could improve understanding of their emergence across organizations. Exploring how projection capability operates across and beyond business ecosystem boundaries may reveal its role in enabling broader systemic transformation processes.
<i>Ecosystem Perspective in SBMI</i>	Q1: What types of ecosystems support SBMI, and how are they created and governed? Q2: How do ecosystems simultaneously support multiple SBMI initiatives? Q3: How can ecosystems be anchored in territorial cooperation and transformation dynamics while remaining connected to international transitions?	Understanding ecosystem configurations and coordination mechanisms is essential for clarifying their contribution to SBMI. Examining how ecosystems support multiple coexisting SBMI initiatives could reveal potential synergies, tensions, and conflicts between initiatives. Exploring how place-based collaboration can address global sustainability challenges while remaining connected to international transition dynamics could enrich ecosystem-based perspectives on SBMI.

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Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at [doi:10.1016/j.jengtecman.2026.101999](https://doi.org/10.1016/j.jengtecman.2026.101999).

Data availability

No data was used for the research described in the article.

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