

**Louvain School of Management**

**The organizational practices and  
individual competences of  
sustainable innovation management**

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## **Abstract**

In the light of the challenges generated by climate change, many companies are reshaping their innovation strategy to improve the sustainability of their business.

Sustainable innovation (SI) has many advantages for companies, however there are also a lot of barriers and organizational obstacles to its effective implementation and management. In this thesis, our objective is to clarify the concept of sustainable innovation management (SIM), by answering to the following question: “How do the organizational practices and individual competences enable sustainable innovation management?”.

After reviewing the current literature, we carried out a qualitative research on six SI managers of large companies. By comparing our theoretical and empirical findings, we have developed a two-part model that presents the four touchpoints of action for SIM: design, align, assess and involve. Moreover, this model emphasizes on the four outcomes through which the touchpoints enable SIM: (1) relevant sustainable value creation; (2) coordination and mindset shift; (3) real SI performance and progress; and (4) shared value creation. Finally, this model also explains the dynamics between these four touchpoints at a corporate, individual and ecosystem-based level, and presents a set of corporate practices and individual managerial skills.

This model aims to bring a new light on practices and links that weren't highlighted before and to guide managers on which processes and touchpoints they might need to focus on to obtain specific outcomes.

We conclude our thesis by presenting a set of managerial recommendations based on our model, as well as drawing the limits of our work and listing suggestions for future research.

*Keywords:* Sustainable innovation management, Sustainability, Innovation, Management model, Organizational processes, Individual skills.

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## List of abbreviations and acronyms

**BMI** – Business model innovation

**CS** – Corporate sustainability

**CSI** – Corporate social innovation

**CSM** – Corporate sustainability management

**CSR** – Corporate social responsibility

**DC** – Dynamic capabilities

**DT** – Design thinking

**IM** – Innovation management

**KPIs** – Key performance indicators

**NGOs** – Non-governmental organizations

**R&D** – Research and development

**SBMI** – Sustainable business model innovation

**SI** – Sustainable innovation

**SIM** – Sustainable innovation management

**SVP** – Sustainable value proposition

**TBL** – Triple bottom line

## INTRODUCTION

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Climate change has been considered as top priority threat to companies' growth, due to issues like resource scarcity, growing social inequity, air and water pollution (United Nations Global Compact & Accenture Strategy, 2019). According to the 23<sup>rd</sup> Global CEO survey from PwC, this threat has been even more intense for companies in Western Europe and Asia-Pacific where "many governments have committed to net-zero emissions by 2050" (PwC, 2020, p.42). However, these threats and the integration of sustainability considerations into the business strategy have enabled opportunities for innovation through new products, services and technologies (KPMG, 2019). Sustainable innovation (SI) has driven the transformation in companies by offering new solutions to critical challenges, such as the food industry and the "waste tracking technologies supporting advances in reducing food that gets lost or wasted, which currently accounts for a third of global production" (United Nations Global Compact & Accenture Strategy, 2019, p.62).

Despite these opportunities, innovating for sustainability requires a major shift and systemic transformation that is still considered as a challenge with a lot of uncertainties. One stunning acknowledgement given by the UN Global Impact report is that only "48% of companies are implementing sustainability into operations" and that CEO's are acknowledging that "their industries and business as a whole are not doing enough" (United Nations Global Compact & Accenture Strategy, 2019, p.62). Therefore, the implementation and management processes of SI are important and relevant topics today.

SI gained interest as well in the literature as many authors have highlighted the growing importance of sustainability as a key driver of innovation. Some have categorized the different types of sustainable innovations (Adams, Jeanrenaud, Bessant, Denyer & Overy, 2016), others have provided theoretical frameworks regarding the implementation or advantages of innovating for sustainability (Evans, Fernando, & Yang, 2017; Aagaard, 2018). Sustainable innovation management (SIM) gained also some interest as the barriers to SI appear to be mainly organizational and managerial (Clark & Charter, 2007). Even though the concept is clearly defined (Cillo, Petruzzelli, Ardito & Del Giudice, 2019), the dynamics of SIM allowing the transformation of organizations towards sustainability are poorly studied. Management models around SI have also been developed (Inigo & Albareda, 2019) but the novelty of this

concept seems to have held back the development of a holistic model on the management of SI, at an organizational and individual level.

Therefore, driven by the objective to bring more clarity to the functioning of SIM, this paper aims to help managers understand what practices and competences lead to SI and the dynamics and interconnections hiding behind SIM, as an integrated process. Our research will be answering the following question: *How do the organizational practices and individual competences enable sustainable innovation management?* As we will look at SIM through a holistic point of view, we want to clarify that we do not pretend to discover a general truth or bring solutions that will help every SI manager in the world. Our objective would rather be to bring a new light on elements and links that weren't highlighted before and guide managers on what elements they might need to focus on more to obtain specific outcomes.

Regarding the structure of this thesis, the *first part* consists of a review of the current literature. In chapter one, we clarify the concept of SI through the evolution of its definition over the years, its characteristics regarding the business strategy, as well as the barriers that exist to implement it efficiently. Due to the mainly managerial and organizational aspect of these barriers, we proceed, in chapter two, to the clarification of the concept of SIM by examining the organizational practices as well as the individual competences necessary when managing SI. Finally, chapter three is dedicated to the review of four different management models or frameworks that have allowed a better understanding of SIM practices and their interactions with each other.

The *second part* of this thesis consists of the empirical research and begins with the first chapter presenting the methodology that was applied for this research, from the design, to the data collection and analysis. The second chapter presents the results of our data analysis through the main elements that have emerged regarding the organizational practices and the individual managerial competences. Then, in the third chapter, we present the two-part model that we have developed from confronting our empirical results to the findings from the literature review, and we discuss the theoretical and practical contributions of this model.

At the end, we *conclude* our thesis by a summary of our research and findings where we answer our research question. We also present our managerial recommendations based on our findings, the limits of our work and our suggestions for future research.

## PART I : LITERATURE REVIEW

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### Chapter 1: Sustainable innovation

#### 1.1 Introduction

Over the last three decades, there has been a growing interest in literature regarding the potential of innovating for sustainability at a corporate level. There have been plenty of concepts and names used to describe innovations with a sustainability focus, such as eco-innovations, sustainability-driven innovations, green innovations, sustainability-oriented innovations and sustainable innovations (Varadarajan, 2017). The latter will be at the heart of this paper, as being the most general and commonly used of them all (Stock, Obenaus, Slaymaker, & Seliger, 2017). In order to fully understand the concept of SI, in this chapter, we will examine how the literature has defined it through the years, how it differs from traditional innovation, how it is relevant as a business strategy today, what interesting practices can be linked to it and what barriers the literature have identified to its successful implementation.

#### 1.2 Definitions and evolution of concepts

The first stream of literature about SI happened right after the worldwide rise of interest for sustainability with the Brundtland report of 1987 (Aagaard, 2018). Also known as the United Nation's *Our Common Future*, this paper has introduced environmental considerations into consumers, politics and also businesses' new decision-making agenda (Jorna 2017; Aagaard, 2018). After that moment, many businesses felt a pressure from consumers and environmental lobbies to demonstrate their responsibility towards society as they knew that "traditional" innovations wouldn't be enough anymore, if they would be perceived as unsustainable by consumers (Hall & Vrendenburg, 2003). As an answer to this new behavior among companies, Peter James (1997) had for the first time defined SI as "the process of developing new products, processes or services which provide customer and business value but significantly decrease environmental impact" (cited in Clark & Charter, 2007, p. 9). This definition, as well as the first stream of literature, has focused more on the environmental aspect of this new type of innovation. Interconnected with eco-innovation, many researchers have defined SI as a new set of standards and compliances for companies to respect, that would result in reduced environmental impacts (Larson, 2000; Johansson & Magnusson, 1998). This SI definition also emphasizes on the importance of integrating these environmental requirements into all stages

of the new product lifecycle (Kaebernick, Kara & Sun, 2003). According to Choi, Nies and Ramani (2008), the lifecycle assessment theory impacts SI by helping companies apply new methodologies and tools in every step of the product development, from raw materials to end of life, in order to innovate in a sustainable way.

The second stream of literature was born as a response to the previous one. Many researchers have pointed out the need to transcend these compliances as SI includes also social and ethical dimensions and is “more clearly linked to the holistic and long-term process of sustainable development” (Boons, Montalvo, Quist & Wagner, 2013, p. 3). A new definition of SI, which many authors have relied on (Stock et al., 2017; Aagaard, 2018), appeared in the works of Clark and Charter:

Sustainable innovation is a process where sustainability considerations (environmental, social and financial) are integrated into company systems from idea generation and development (R&D) and commercialization. This applies to products, services and technologies, as well as to new business and organizational models. (Clark & Charter, 2007, p.9)

This definition will be the one we will refer to in this paper, when mentioning SI, as it integrates all the dimensions sustainability can have as well as the lifecycle assessment theory. It is also involving the organizational aspect of innovating for sustainability and the importance of business models to support these innovations at a corporate level. This literature stream also pushes the notion of perceiving SI as a long-term business strategy that should be rigorously studied and analyzed in order to be the most efficient, with the less negative impact (Boons et al., 2013). Companies that implement SI as a strategy have to compete in constantly changing markets, while contributing to sustainable development (Klewitz & Hansen, 2014), and adaptability represents one of the main qualities they need to have (Glauner, 2018). According to Asongu (2007), SI requires “unforeseen identification of more efficient methods of doing business or new types of products or services that may not have occurred without sustainable initiatives in the first place” (cited in Bachner, 2018, p. 337).

Another interesting stream of literature puts the emphasis on sustainable innovative entrepreneurs and the importance of their role (Aagaard, 2018). The entrepreneurs who shape, manage and organize SI and represent the “innovative, market-oriented and personality driven

form of creating economic and societal value by means of break-through environmentally or socially beneficial market or institutional innovations” (Schaltegger & Wagner, 2011, p. 226). Their creativity and new knowledge acquired by collaborating with multiple stakeholders<sup>1</sup> are the main qualities that can create sustainable innovative value (Correia de Sousa, 2006). These researchers define SI as a process based on the stakeholder theory, which according to Freeman (1984), requires companies to take into account the interests and needs of stakeholders in the strategic planning and decision-making process (cited in Altenburger, 2018). Thus, SI is continuously fueled by stakeholders and knowledge-integration as a source of ideas (Ayuso, Rodriguez & Ricart, 2006). There always has to be a dialogue between companies and stakeholders in order to be fully innovative and sustainable in every manner (Freeman, Harrison, Wicks, Parmar & De Colle, 2010).

Finally, one more stream of literature recognizes SI as companies’ driving force to change (Adams et al., 2016). Here, organizations implement innovative sustainable practices in order to create a shift: re-shaping their business and ecosystem will set the way for other companies to act for sustainability as well (Draper, 2015). Adams et al. (2016) define SI as “making intentional changes to an organisation’s philosophy and values, as well as to its products, processes or practices to serve the specific purpose of creating and realising social and environmental value in addition to economic returns” (cited in Evans et al., 2017, p. 207). According to Adams et al. (2016), these SI processes can be categorized as: (1) operational optimization, when companies do the same things but better, (2) organizational transformation, when they do good by creating new things, and (3) systems building, when they do good by creating things with others (Appendix 1). This literature stream emphasizes on the fact that organizations are a part of society, they have their eco-system, and through SI and “multiple interventions across different areas of society”, they can lead systemic change (Evans et al., 2017, p. 207).

After looking at all these evolutions, we have observed that there is not one single definition generally accepted by all authors. There could be plenty of new definitions of SI emerging in the future as this concept is directly related to current concerns. However, in this paper, we will refer to SI according to the definition given by Clark and Charter, as mentioned above.

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<sup>1</sup> Groups or individuals who can affect or be affected by the business of an organization (e.g. suppliers, customers, governments, non-governmental organizations,...) (Lenssen & Smith, 2019).

### 1.3 SI compared to traditional innovation

As SI surfaced in literature but also in practice as a new type of innovation answering the sustainability related needs of consumers and companies (Aagaard, 2018), it seems relevant to define the characteristics of the “original” concept of innovation and compare them with SI.

Although innovation is a fairly old concept, it has not actually received a lot of attention among the scholars before the 20th century. Joseph Schumpeter was the first to lay out a clear definition for this concept (Śledzik, 2013). Schumpeter was convinced that innovation and the factors influencing it were the driving force behind a long-term economic and social change (Fagerberg, 2018). In his first theories, Schumpeter (1942) defined innovation as the *creative destruction* that feeds the economy while the entrepreneurs take on the role of change creators, in societies often resistant to new ways (cited in Fagerberg, 2013). Thus, the entrepreneurial function is a central concept in Schumpeter’s theories (1949) as entrepreneurs, using their leadership and vision qualities, have to fight continuously to revolutionize the current processes and create the mutation of the system (cited in Fagerberg, 2013). Schumpeter (1942) also created the conceptual distinction between disruptive and incremental innovation, the latter being a result from linear progression where we can predict to some extent each innovation from the ones that preceded it (cited in Fagerberg, 2013). This can represent improvements of existing products or processes, within the context of a dominant design or existing demand (Rossi, 2002). In contrast, disruptive innovation results from discontinuous, non-linear change and involves a major radical break from existing products and processes and often opens up new industries and new markets (Fagerberg, 2013; Rossi, 2002).

According to Schumpeter (1934), innovation consists of any one of the following phenomena: (1) introduction of a new good, (2) introduction of a new method of production, (3) opening of a new market, (4) conquest of a new source of supply or raw materials or half-manufactured goods, and (5) implementation of a new form of organization (cited in Bachner, 2018). Although this typology has evolved over the years, the Oslo Manual, a joint publication of the OECD and Eurostat, still identifies four types of innovations, rather similar to Schumpeter’s: (1) product, (2) process, (3) organizational and (4) marketing innovations (OECD & Eurostat, 2018).

A more recent definition may also be found in the Oslo Manual where innovation is:

A new or improved product or process (or combination thereof) that differs significantly from the unit<sup>2</sup>'s previous products or processes and that has been made available to potential users (product) or brought into use by the unit (process). (OECD & Eurostat, 2018, p.20)

The two key components, inherent to this concept are novelty and commercialization (Greenhalgh & Rogers, 2010). The degree of novelty relates to whether an innovation is new to a firm, a market, an industry or to the world (Edison, bin Ali & Torkar, 2013). The general “bringing to market of a truly novel item” (Greenhalgh & Rogers, 2010, p. 5) is what distinguishes innovation from imitation, which is the adoption of something new but already existing on the market. The other dimension is that innovation must be put into use or made available on the market for others to use (OECD/Eurostat, 2018). This marks the difference between innovation and invention, or also called creativity, which Schumpeter stated (1942) as something that also contributes to the stock of knowledge but is not instantaneously put out in the commercial market (cited in Ferauge, 2012). This distinction has brought up a lot of confusion in the scientific world, but it is necessary to consider them as two separate phases of a chain where creativity is the starting point and innovation the completion (Ferauge, 2012). Finally, there is one last precision to bring to this definition which is a distinction with change. The novelty property of innovation always implies that an innovation comes systematically with a change but the opposite is not true (Ferauge, 2012). These two notions can be intertwined but again we have to clearly distinguish them, as an organizational change, for example, does not lead to an innovation in all cases.

When comparing the concept of innovation with SI, we can first see that the Schumpeterian theory about entrepreneurs still holds. Many authors discussed the importance of sustainable entrepreneurs as a source of innovative creativity and a starting point of the stakeholder dialogue that allows companies to create the most accurate sustainable value (Correia de Sousa, 2006; Aagaard, 2018). Next, regarding the typologies of SI, they follow the same classification as the one provided by the OECD stated above (Charter, Gray, Clark & Woolman, 2017). However, another one is also commonly used where SI has four main levels which can be defined according to Stevels (1997) as: (1) incremental improvements to existing products; (2)

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<sup>2</sup> Any actor responsible for the innovation.

limited re-design of existing products regarding technical feasibility; (3) product alternatives to satisfy same functional needs; and (4) new system designs for a sustainable society (cited in Clark & Charter, 2007). This typology is very much related to product development even though companies have adapted it for processes or organization-oriented innovations as well (Varadarajan, 2017). Regarding the distinction between disruptive and incremental innovation, sustainable development is considered, by some authors, to require disruptive and systemic innovations (Evans et al. 2017). According to Boons et al. (2013), SI will be more effective when created on the basis of business models, as they provide a conceptual relation between SI and financial performance at higher system levels and radically transform the purpose of organizations. Finally, regarding the characteristics of innovation, businesses practicing SI create novel and competitively priced products, processes, systems or services with “minimal use of natural resources and pollution while satisfying legal standards, norms and stakeholder requirements” (Charter et al., 2017, p. 58).

Therefore, even though SI’s characteristics are usually more developed around the sustainability aspects, they share a lot of common elements with the OECD’s definition of traditional innovation, especially regarding novelty and market availability. Thus, SI seems to be the righteous successor of the innovation concept, which, influenced by the rise of sustainable development theories, has evolved into a more disruptive, systemic, transformative and value creative innovation.

## 1.4 SI as a business strategy

Until now, in this paper, SI seemed to be a necessity for companies in order to answer to the evolving needs among customers after the rise of consciousness around sustainability (Hall & Vrendenburg, 2003). However, many authors demonstrated the relevance of SI also as a profitable business strategy and not only as a coping mechanism (Aagaard, 2016).

### *1.4.1 Competitive advantage and economic growth*

The role of innovation as a fundamental driver of competitiveness for companies was already proven and developed very early on among scholars. According to Schumpeter (1934), if a company introduces successfully a major innovation on the market, a higher profit rate should follow as this innovation creates an “opportunity to gain earnings through the temporary establishment of a monopoly” (cited in Guerrero-Villegas, Sierra-García & Palacios-Florencio,

2018, p. 1352). Indeed, innovation allows organizations to obtain a strategic position on the market by providing new products and satisfying customers' evolving needs (Kuncoro & Suriani, 2018). As the companies built on SI integrate their stakeholders into their decision-making process (Ayuso et al., 2006), they have an ability to respond to their specific demands in various contexts (Guerrero-Villegas et al., 2018). Thus, companies can benefit from reduced transaction costs, increase their legitimacy and trust, and gain advantage over their competitors (Choi & Wang, 2009). On the contrary, companies that will not innovate in a sustainable way, will suffer from a lack of legitimacy and encounter social rejection from their stakeholders (Bansal, 2005).

SI can also be the main driver for economic growth, as new sustainable initiatives can create new demands or offer a wider perspective of profitability, therefore contributing to long-term continuity (Hernandez-Vivanco, Bernardo & Cruz-Cázares, 2018). Although at first it would seem that growth and sustainability are mutually exclusive concepts, as in the last century, environmental damages increased while the economy flourished (Higgins, 2013). However, there has been plenty of research that proved the opposite with the new concept of sustainable economic growth (Ferreira, Fernandes & Ferreira, 2020). Not only environment protection itself can generate profit, but the change from consumers towards a more sustainable lifestyle can also create new opportunities (Cohen, 2020). As the majority of people will not stop consuming, but rather only change their consuming needs or preferences, companies will need to evolve in order to keep these consumers, and SI enables to provide these new socially desirable solutions (Ferreira et al., 2020, p. 2)

#### *1.4.2 Sustainable value creation*

Many companies' business model is based on "creating, delivering and capturing economic value, with limited or no attention to environmental and social value" (Evans et al., 2017, p. 204). The objective of SI is to minimize the negative impacts of the production process and activities while also creating added value for customers and stakeholders (Klewitz & Hansen 2014). And there is a growing need for sustainable value creation due to the constantly changing market, higher engagement from stakeholders in business and environmental debates, limited resources and the rise of corporate social responsibilities (Evans et al., 2017). According to Cacino, La Paz, Ramaprasad & Syn (2018), sustainable value has a three-dimension structure: (1) environmental value (e.g. pollution prevention), (2) social value (e.g.

community development) and (3) economic value (e.g. long-term viability). Therefore, creating sustainable value is essential in terms of financial returns but also as a relevant way to maintain enduring relationships with key internal and external stakeholders (Evans et al., 2017; Cacino et al., 2018). Sustainable value creation is a process that is often managed through frameworks or business models and is tightly controlled due to its high importance regarding profitability (Aagaard, 2018).

#### *1.4.3 New creative mindset*

Through SI, companies are confronted to an increasing need to address environmental and societal challenges (Aagaard, 2018). This confrontation is considered as a brand-new source of inspiration that could lead to innovative opportunities as well as to result in increased creativity and ability to predict changes (Hansen, Grosse-Dunker & Reichwald, 2009; Tredgold, 2018). Indeed, in order to implement sustainable innovations, organizations tend to use a problem-solving approach where they take into consideration every aspect of the whole system (Evans et al., 2017). According to the Rocky Mountain Institute (2006), “optimizing not just parts but the entire system takes ingenuity, intuition, and teamwork. Everything must be considered simultaneously and analyzed to reveal mutually advantageous interactions (synergies) as well as undesirable ones” (cited in Evans et al., 2017, p. 205). This rational thinking helps them detect and understand interconnections between problems and how to improve already existing systems (Stark, 2018). This approach also allows members of the organization to develop a strong sense of what Scharmer (2009) called entrepreneurial improvisation or “a continuous readiness and an ability to act-in-an-instant” (cited in Stark, 2018, p.104). This skill can lead to great innovations that would open to new markets or fast adaptability to existing markets’ unstable behaviors (Stark, 2018). Both of them would reduce production costs and would lead to a solid competitive advantage for companies as they would help them be more in line with the constantly evolving market (Aagaard, 2016).

### 1.5 SI and corporate sustainability practices

In order to implement SI as a business strategy and benefit from its advantages, the literature has emphasized on some corporate sustainability practices and principles that can support these SI drivers. As we mentioned before, the concept of SI appeared in the aftermath of the Brundtland report, the rise of interest for sustainable development and the pressure, from

consumers and lobbies, to integrate sustainability into the corporate agenda. Therefore, it seems relevant to discuss some sustainability – oriented practices that frame SI.

### *1.5.1 Open innovation*

One of the main characteristics of corporate sustainability, that applies to SI as well, is the integration of external and internal stakeholders' engagement into the value-creation and decision-making process (Ayuso et al., 2006). Therefore, SI is an interactive process where an organization cannot really innovate in isolation (Altenburger, 2018) and has to open its innovation process to other actors of the ecosystem. First, defined by Chesbrough (2006), open innovation became a concept studied by many authors and according to Lichtenthaler (2011), it is defined as “systematically performing knowledge exploration, retention, and exploitation inside and outside an organization’s boundaries throughout the innovation process” (cited in Altenburger, 2018, p. 5). The principle behind this paradigm is to encourage a systematic and radical change in the way intellectual property is used and managed by companies and thus, create synergies among firms (Ganzerla, Colapinto & Rocco, 2015). According to Chesbrough (2011), there are two kinds of openness: the one from the outside in , where companies use knowledge and technologies from external stakeholders by co-creating value or buying inventions and patents from other companies ; and the one from the inside out, where a firm allows its internal innovations to be used outside its own business through licensing or joint ventures (cited in Altenburger, 2018).

The benefits for companies to interact and collaborate with their eco-system are mainly related to sharing risk and reward (Ganzerla, Colapinto & Rocco, 2015). According to Martovoy (2014), they also imply cost reduction, opportunities to access to new partners and unique resources, by leveraging similarities, reduced time-to-market as well as enhanced credibility (cited in Altenburger, 2018). However, open innovation requires a great system to assimilate knowledge as well a thorough management at the same time (Lopes, Scavarda, Hofmeister, Thomé & Vaccaro, 2017). Therefore, managing open innovation is related to knowledge management as it leads to using mechanisms that allow companies to operate knowledge like an asset for business development that would stimulate the creation of new, more adapted products and services to the evolving customers' needs (Lopes et al., 2017).

### *1.5.2 Corporate social innovation*

Considered by many authors as the new, improved version of corporate social responsibility (Dionisio & de Vargas, 2020), that integrates SI into the corporate world, corporate social innovation (CSI) is defined as:

The strategy that combines a unique set of corporate assets (innovation capacities, marketing skills, managerial acumen, employee engagement, scale, etc....) in collaboration with the assets of other sectors and firms to co-create breakthrough solutions to complex economic, social, and environmental issues that impact the sustainability of both business and society. (Mirvis, Googins & Kiser, 2012, p. 3).

This concept was first introduced by Kanter (1999) as a proposal for strategic alliances between companies and the social sector that would result in profitable and sustainable changes for both, according to the principle that combining energies to solve societal issues stimulates businesses' own growth and development (cited in Dionisio & de Vargas, 2020). CSI also integrates the concept of shared value creation as defined by Jayakumar (2017) where CSI is “when the company uses innovations to differentiate itself from competition to create competitive advantage (organizational outcomes) and shared value (societal outcomes)” (cited in Dionisio & de Vargas, 2020, p. 7).

Although this concept derives from corporate social responsibility (CSR), there are key differences between them. First, CSR is fueled by a philanthropic intent from companies in order to improve or restore their company image while CSI comes from a strategic intent by companies, managed like other corporate investments (Mirvis et al., 2012; Dionisio & de Vargas, 2020). Second, CSR requires heavy contributions of money and manpower, in opposition to CSI that targets a societally relevant R&D and employs a whole range of corporate assets to the challenge at hand (Mirvis et al., 2012). Third, CSR usually involves contracts with nongovernmental organizations (NGOs) or community groups to deliver social services while CSI involves a deeper collaboration between companies or with external parties to co-create a new sustainable solution to social issues (Mirvis et al., 2012; Herrera, 2015). Finally, whereas CSR generates social good and enhances corporate reputation (Mirvis et al., 2012), CSI aims to generate a sustainable social change by producing new sources of revenue and creating a “more socially relevant innovation system and corporate culture that can be a source of competitive advantage” (Herrera, 2015, p. 2). Therefore, it appears that CSI is a

broader concept, not only encompassing internal changes through more productive management, but also external changes, by establishing partnerships with stakeholders, driven by the only objective of building a strong strategy to “reach competitive advantages and achieve economic and social returns by developing new ideas, institutions, ways of working, products, services, business models, and processes” (Dionisio & de Vargas, 2020, p. 9).

### *1.5.3 Sustainable business model innovation*

According to Teece (2010), the business model is the architecture behind the mechanisms of how a company creates and delivers value, how it attracts consumers and how this value is converted into profit (cited in Evans et al., 2017). Business model innovation (BMI) is introducing innovations in these mechanisms and it represents a great way to increase a company’s resilience to changes in order to gain competitive advantage (Geissdoerfer, Vladimirova & Evans, 2018). Due to the increase of sustainability challenges, firms have seen the opportunity to gain profit from embedding these issues into the BMI process, an approach known as sustainable business model innovation (SBMI), where the design of the firm is conceptualized as a way to improve its environmental and social sustainability (Bocken & Geradts, 2019).

This practice was first introduced by Stubbs and Cocklin, in 2008, and since then, many authors have developed typologies or classifications. A first interesting contribution was made by Boons and Ludeke-Freund (2013) which defined three types of SBMI: (1) technological innovation where the business model offers value in terms of new commercialization, distribution or production; (2) organizational innovation where value comes from shaping the culture and structure of the company in order to change the way of doing business and (3) social innovation when value comes from social benefits (cited in Aagaard, 2018). Another interesting part of SMBI are the different elements that compose it: (1) sustainable value propositions innovation, defined as a company’s promise to always offer value to its customers, by seeking new opportunities and maintaining long term relationships with its stakeholders; (2) sustainable value creation and delivery innovation, the company’s capability to manage resources, processes and capabilities by including stakeholders ; and (3) sustainable value capture innovation, the company’s ability to capture value by designing new sustainable revenue models and cost structures (Shakeel, Mardani, Chofreh & Klemeš, 2020).

Although SBMI is still a young concept and the term is not validated by everyone, business model innovation has already been defined as one of the best practices to integrate sustainability into the core of the business (Lenssen & Smith, 2019; Shakeel et al., 2020).

## 1.6 SI barriers

Even though the benefits of SI are very clear, companies may encounter obstacles and barriers on multiple levels when implementing it (Bocken & Geradts, 2019). According to Clark and Charter (2007), there are five types of barriers that could slow down or put a stop to the adoption of SI as a corporate and business strategy.

First, organizational obstacles that represent weaknesses in the company leading to poor SI management. From lack of senior level understanding and commitment to inflexible organizational structures and procedures, these obstacles are internal, and they often represent the biggest barrier for companies to even start having an interest in sustainable development. Second, conceptual obstacles related to a lack of sustainability education and awareness as well as a lack of knowledge about SI solutions seem to be another important internal barrier. This is also linked to the lack of practical examples and the differences between theoreticians' ideas and the real world and market (Vasilenko & Arbačiauskas, 2013). Third, although policies and legislations are most of the time the drivers of corporate sustainability, as they require compliance, a lack of policies can represent a major obstacle for SI. Indeed, SI needs strong, coherent, flexible and future-oriented environmental policies coming from large institutions which can set proper standards and frameworks for companies. Next, obstacles in systems and structures related to a lack of strong relations between the company and its stakeholders can make the implementation of SI really difficult as the stakeholder theory is essential. A fragmented decision-making process due to a global-size supply chain can also slow down the improvements on social and environmental issues (Bocken & Geradts, 2019). Finally, implementing SI can generate lot of financial costs and would sometimes need a big amount of capital that smaller and medium sized companies struggle to have (Bocken & Geradts, 2019). Although socially responsible investment is growing, there is a consideration from certain investors and shareholders that the financial returns of SI are insignificant or take too much time (Clark & Charter, 2007).

## 1.7 Conclusion

In this chapter, we have explored the characteristics SI and presented the definition of SI we will refer to from now on. We also explained in what ways SI is the evolution of traditional innovation. SI appears to be a fairly new concept that has many different names and definitions. We have also presented the three main reasons why SI can be a great business strategy, the different corporate practices that can support the SI strategy as well as the barriers that exist to implement SI efficiently. These barriers appear to be mainly managerial and related to the organizational processes and practices of SI. Therefore, we will proceed in the second chapter to look more closely to the management that enables SI and try to understand how the barriers to SI can be lifted.

## **Chapter 2: The managerial practices of sustainable innovation**

### **2.1 Introduction**

As more and more companies tend to adopt SI as a business strategy, the need to have well-structured management systems is increasing (Glauner, 2018). Indeed, in order to succeed in front of this new challenge of effective innovation that has to maximize sustainable value, organizations are not only required to implement effective SI solutions (Hernandez-Vivanco et al., 2018). Even though a general assumption represents innovation as a technical task, in reality all the core areas of an organization are involved and only a proper management and controlling system will allow the organization to reach its objectives (Vitezic & Vitezic, 2015). Current literature has defined more clearly innovation management and corporate sustainability management separately. Therefore, we will look at both of these concepts in detail and define SI management based on our findings as well as its managerial implications.

### **2.2 Innovation management**

#### *2.2.1 Definitions and characteristics*

While innovations concern the invention, modification or improvement of products, services or business models, innovation management (IM) rather involves people, processes and the organization of systems. Considered as a central concern for managers, IM is often referred to as a tool that can help them develop the core drivers of their businesses for competitive advantage. Therefore, one definition for IM can be about its “means-to-ends” relation with innovation, as innovation is the achievement of successful IM (Glauner, 2018). Another definition for IM, according to Dankbaar (2003), can be the combination of two separate but complementary approaches:

On one hand, innovation management can be defined as the creation of preconditions to promote human creativity, including strategic commitment and context management.

On the other hand, innovation management can be seen as a process to foster the application of knowledge (cited in Igartua, Garrigós & Hervas-Oliver, 2010, p.42).

Thus, IM concerns the ability of an organization to develop and to manage a creative climate in which innovation can take place and to deal with issues related to “human systems development” (Glauner, 2018, p. 134), motivation and productivity. The systematic processes related to IM includes also the regulation and application regarding innovative solutions with

a need for adapting and learning continuously, in order to find the best suited solution to each problem, while doing it in the most appropriate ways according to the environment and the circumstances in which the organization finds itself (Tidd & Bessant, 2018; Aagaard, 2018).

For the last decades, the literature around IM has increased and went through a lot of evolution as the interest towards innovation grew, due to its positive effects on sales and market share growth, productivity improvement and efficiency in operations (Alfaro-Garcia, Gil-Lafuente & Calderón, 2017). At first, in the 1970s, according to Gimbert et al. (2010), the main centre of interest for IM was around its measurement where only the indicators for input were analysed, like the amount of investment on R&D, the number of acquired patents and the amount of highly qualified human resources (cited in Alfaro-Garcia et al., 2017). However, IM theories have evolved towards a more system-based consideration that has to be approached with a holistic framework, not only involving the technological innovation (Alfaro-Garcia et al., 2017). Measuring IM has become more complex as the factors defining its success have become more organizational (Tidd & Bessant, 2018).

An organization's capacity to manage innovation by transforming ideas into usable and profitable products requires a very highly developed inter-functional coordination and integration (Adams, Bessant & Phelps, 2006). In other words, at each step of the innovation process, which relates to various functions in the organization, there is a need to involve everyone in the process and operate these synergies effectively on a day-to-day basis (Vitezic & Vitezic, 2015). Usually, innovation is a synonym of change that happens throughout the whole company and it should be followed by a global transformation of every involved sector's organizational routines (Tidd & Bessant, 2018).

An effective way to manage innovation is by following four main steps: (1) *search* for potential opportunities by analysing the organization's environment ; (2) *select* the opportunities to develop based on strategic feasibility ; (3) *implement* these ideas by acquiring knowledge and resources, executing it efficiently despite uncertainties, launching it on the market and sustaining its adoption on the long term ; and finally (4) *learn* and acquire knowledge from this process in order to improve IM continuously (Tidd & Bessant, 2018). This new routine does not happen in a vacuum, it is influenced by the general context of the organization, therefore there is a real need for these actions to be controlled and coordinated by a global operationalization of corporate practices (Aagaard, 2018).

### 2.2.2 Key practices

According to Igartua et al. (2010), IM involves many different components and practices that require attention, each time, with different areas of measurement. We will go through these components based on a review of multiple papers discussing this subject.

The first practice is *innovation strategy*, which represents the articulation of an embedded commitment towards innovative goals (Adams et al., 2006). On a day-to-day basis, this takes the form of developing and updating a consistent innovation policy with the organization's mission, managing activities based on this policy and setting goals for innovation (Igartua et al., 2010). This also includes a top-management responsibility and strong leadership that will allow the organization to communicate internally about the long-term direction and vision, and according to O'Brien's (2003), integrate innovation into the culture and behaviours of the company (cited in Adams et al., 2006). To measure innovation strategy, a first step would be to check its existence through elements like long-term administrative commitment, pro-active attitude of the directors and the allocation of resources towards innovation (Alfaro-Garcia et al., 2017). Another step, according to Bessant (2003), would be to evaluate the strategic fit of the innovation strategy regarding the organization and the alignment of the innovation goals with the structures and strategic objectives (cited in Adams et al., 2006).

The second practice is *knowledge management*, that is related to acquiring, exploiting and communicating ideas and information underlying the innovation competencies (Alfaro-Garcia et al., 2017). According to Nonaka (1991), knowledge can be explicit, like patents, or tacit, like skills learnt by experience (cited in Adams et al., 2006). The three main areas of measurement are: (1) the number of new ideas generated by the firm, (2) the accumulated knowledge over the years also called knowledge repository, and (3) information flows like external linkages with other organizations or customers (Adams et al., 2006). Another valuable aspect is the evaluation of absorptive capacity which is defined by Cohen and Levinthal (1990) as the "ability to recognize the value of new, external knowledge, assimilate it, and apply it to commercial ends" (cited in Adams et al., 2006, p.29). Indeed, high level of this capacity tend to have a positive effect on companies' innovation and performance levels (Igartua et al., 2010).

The third practice is *inputs management* where inputs can be defined as all the resources for innovation activities, ranging from people, to equipment, to funds, and even to tools generating

ideas. Regarding human resources, they can be measured as the number of people that are committed to innovate, by a challenging and motivated behavior. Regarding physical and financial resources, they are usually measured in terms of money. At first the focus was on R&D investments, but it has been proven through time that high intensity R&D is not proof of good innovation practices. Today, adequate funding can be measured with expenditure data (Adams et al., 2006). And regarding tools, they are measured through their formal use by the organization, for creativity promotion or quality control management (Igartua et al., 2010). Chiesa et al.'s (1996) technical innovation audit is a great way to measure the consistency in the use of these tools and its integration into the management processes (cited in Adams et al., 2006).

The fourth practice is *organizational culture and structure* which is defined by work environments supporting innovation processes and encouraging their staff to adopt creative behaviors (Tidd & Bessant, 2018). There are many different ways to measure this component as it received a lot of attention among scholars. It can be measured through more individual characteristics of the workers like a strong sense of freedom, empowerment, autonomy, job satisfaction, trust towards the company or lack of fear regarding failure. It can also relate to more organizational aspects like the communication of a clear shared vision, the flexibility to change and to respond quickly to needs or the commitment of the company to achieve the highest standards (Adams et al., 2006).

The fifth practice is *portfolio management* that can be defined as the act of evaluating technology and products portfolios by their worth and choosing the ones that meet the needs of the organization the best (Igartua et al., 2010). Due to the fast-changing environment of organizations, this dynamic management requires a lot of flexibility and it is an essential element to gain competitive advantage as it aims to build the optimal portfolio between returns and risks (Adams et al., 2006). The most common way to measure the evaluation and selection of projects, according to Cooper et al. (2001), is either through financial factors such as internal rate of return, net present value and return on investment, or qualitative approaches like peer-review and subjective perceptions (cited in Adams et al., 2006). Another way is through the formalization of the portfolio management which, according to Jugend and Da Silva (2013), must be based on a “rational and objective choice based on a systematized path of multi-criteria dimensions” (cited in Alfaro-Garcia et al., 2017, p. 5)

The next practice is *project management* that concerns the abilities and processes of a company to transform the inputs into profitable innovations (Adams et al., 2006). As the innovation process is full of high levels of uncertainty, complexity and can occur under multiple simultaneous projects, it is a necessity to manage it and to make sure of its efficiency (Igartua et al., 2010). There are four approaches to measure this efficiency: (1) quantitative factors like project cost, duration and innovation speed ; (2) internal communication settings inside the organization ; (3) the level of collaboration with suppliers, customers and their contribution to the innovation process ; (4) the use of formal tools and processes to control and structure decision making, problem-solving and product development (Adams et al., 2006).

The last practice is *commercialization* which represents the bringing to market of an innovation (Tidd & Bessant, 2018). According to Kelm et al. (1995) it is a “transitional phase in which the organization becomes less reliant on its technological capabilities but more dependent on market dynamics” (cited in Adams et al., 2006, p. 37). It can be one of the most important components as it is directly responsible for the commercial viability of an organization (Adams et al., 2006). To measure the intensity of commercialization, it can be done through the number of products launched in a given period: market research and consumer reach abilities; synergies between technology, marketing and business strategy; and even the amount of inputs for launching a product such as salesforce or promotional support (Adams et al., 2006; Alfaro-Garcia et al., 2017).

Therefore, we can see that IM is a process that concerns every part of an organization, that must be integrated into the global strategy and also managed and measured carefully in order to reach its objective to implement successful innovation (Tidd & Bessant, 2018).

## 2.3 Corporate sustainability management

### 2.3.1 Definitions and characteristics

The concept of corporate sustainability (CS) represents the “successful market-oriented realization and integration of ecological, social and economic challenges to a company” (Schaltegger, Beckmann & Hansen, 2013, p. 220). As this integration became more and more common over the past decades, the need to operationalize sustainability in order to become truly effective has grown (Johnson & Schaltegger, 2016). Thus, the concept of corporate sustainability management (CSM) came as an answer to this need and is defined as “a

management discipline that focuses on measuring, managing and reporting the sustainability performance of a company” (McElroy & Van Engelen, 2012, p. 221). CSM is a very complex and tricky process which is achieved through the right balance between the internal development of an organization and the consideration of the external context (Lenssen & Smith, 2019). It has to manage the apparent paradox between conflicting demands from shareholders, who want to maximize profits, and stakeholders, who want to integrate social and environmental responsibilities into the decision-making process (Starik & Kanashiro, 2013). CSM has addressed this paradox through the Sustainability Triangle, a successor of the Triple Bottom Line (TBL) framework measuring sustainable business performance, but this is more adapted to managerial implications (Appendix 2). Just like the TBL, it has been designed to better understand the three aspects of corporate sustainability (social, environmental and economic) and how they interact with each other, in order to help managers to identify where action still needs to be made (Schaltegger et al., 2016). Although the objective of management remains the economic efficiency, in order to make a relevant and sustainable contribution to society CSM has to achieve eco-efficiency and socio-efficiency (Schaltegger et al., 2016). The first one can be defined as the “ratio of monetary value added to environmental impact added per unit<sup>3</sup>” (Schaltegger et al., 2016, p.90) while the second one is the “economic value added relative to social measures<sup>4</sup>” (Schaltegger et al., 2016, p.91). The main challenge for sustainability managers is therefore to integrate these aspects into the organization’s general business management model, to rise above trade-offs and generate profitable solutions that do not compromise the effectiveness of one dimension (Johnson & Schaltegger, 2016).

To support CSM, a multitude of tools and instruments have been developed in order to enable organizations to design and select more easily sustainable processes, and programs, as well measure and communicate about sustainability issues more effectively (Johnson & Schaltegger, 2016). Given that CSM is a multi-dimensional concept, that involves multiple levels of an organization, there is a large variety of tools at the disposition of sustainability managers for every corporate function at every level (Starik & Kanashiro, 2013). These tools can concern (1) the measurement of performance like life cycle assessment, sustainability balanced scorecard ; (2) the management of supply chains; (3) the communication and reporting practices like stakeholder dialogue or sustainability evaluation and reporting system

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<sup>3</sup> E.g.: 1000 € sales per 2.5 kg of CO<sub>2</sub> impacts for one computer.

<sup>4</sup> E.g.: 5 000 € worth work project that caused 2 work accidents.

; and (4) management systems and standards regarding auditing (eco- management and audit scheme, ISO 14001) (Schaltegger, Windolph & Herzig, 2012 ; Johnson & Schaltegger, 2016).

As these tools usually fit one or two functions or levels of a company, they are often addressed separately which can create a high amount of specialization, but low coordination. Therefore, it has become necessary today to address them in an integrated manner (Maas, Schaltegger & Crutzen, 2016).

### 2.3.2 *Key practices*

According to Starik and Kanashiro (2013), the importance to develop sustainable solutions that are systematically integrated will represent the biggest challenge for CS managers for the next decade. The following dimensions constitute the main focus points for sustainable business managers today.

A first crucial practice in CSM is *risk management*, a tool for organizational sustainability that deals with the negative externalities for which a company might be held accountable for. These externalities concern the ecological, social and political environment of this company and they must harm or hinder explicit expectations, standards or guidelines the organization was legally committed to (Lenssen & Smith, 2019). Risks are inherent to business and managing them can obviously avoid negative effects such as reputation damages, market share losses, heavy fines and costly trials (Engert, Rauter & Baumgartner, 2016). However, it is more than just compliance: to be effective, risk management needs to be seen as an integral part of the overall corporate strategy through corporate philosophy and culture supported by top management (Engert et al., 2016). Going from human rights to corporate governance risks (Appendix 3), the implementation of this component is by: (1) identifying the negative externalities, (2) recognizing the liabilities, possible financial and reputational consequences, (3) setting standards and updating them frequently, (4) creating compliance and control processes, (5) preparing a crisis or response management and finally (6) handling media, communications and transparency (Lenssen & Smith, 2019).

A second practice is *issues management*, which is concerned by the more implicit expectations as it has to deal “with the continuously shifting grounds of what is perceived as the responsibilities of business by public opinion at large and specific stakeholders in particular”

(Lenssen & Smith, 2019, p.19). It is a less stable and predictable process as it depends from trends and the evolving mindsets of customers, but it is also very valuable as it can detect new market opportunities and gain competitive advantage (Sommerfeldt & Yang, 2017). To not consider issues like climate change or corruption can create public backlash and be perceived as a lack of corporate responsibility (Lenssen & Smith, 2019). Managing issues can go from the development of timely responsiveness and flexibility, to the process of issues framing, which is, alongside other social or business actors, the definition of an issue in need of change, the creation of an action plan and the incentive to act together (Sommerfeldt & Yang, 2017).

The third practice is *stakeholder management*. Being customers, suppliers or NGO's, there's no organization who does not have stakeholders, as a company always exists in an ecosystem where each actor is interdependent. Managing these actors is about identifying the most important ones and maintaining these relationships through dialogue and by integrating them in the organization's business model (Lenssen & Smith, 2019). This relational capital can be the key to gain competitive advantage: stakeholder engagement can lead to new information that can be used by the organization to detect and solve emerging issues and it is also a critical element to long-term corporate viability (Altenburger, 2018). Managing these relations can also build trust, legitimacy and credibility. However, stakeholders can bring both risks and opportunities that have to be minimize and maximize respectively to create business value (Lenssen & Smith, 2019). Different elements measure effective stakeholder management: (1) the implementation of a visual tool to inform the stakeholders, (2) the process of gathering information and feedback, (3) the use of a platform to keep constant transparency and dialogue and finally (4) creating a joint decision-making board within the company (Lehtinen, Aaltonen & Rajala, 2019).

The fourth practice is *strategic differentiation*. According to Porter (1980), one way of achieving competitive advantage is differentiation, where a company can demand higher prices by developing or investing in products and services that offer unique and desirable qualities to customers (cited in Banker, Mashruwala & Tripathy, 2014). This strategy is about creating economic and social value that will benefit both the company and the stakeholders or society at large (Lenssen & Smith, 2019). Indeed, strategic differentiation allows companies to sustain their current financial performance in the future, even though it might lead to riskier and unstable earnings (Banker et al., 2014). Therefore, managers not only have to choose the products that do not contribute to sustainable performance and rethink them to better meet the

current needs, but they also have to weigh the risks, redefine productivity on the whole value chain and develop local partnerships to reduce R&D costs (Lenssen & Smith, 2019).

The next practice is *business model innovation and transformation*. Sustainable business, just like any other one, is based on business models that can sustain the current environmental and social transformations and make benefits out of them (Lenssen & Smith, 2019). These models are about the process of creating, delivering and capturing value and they need to be updated and innovative to keep up with the fast-paced evolutions of the market and remain relevant for customers (Evans et al., 2017). An effective sustainable business model is about defining, managing and communicating to every stakeholder : the sustainable value proposition, how this value is created and delivered, and how economic value is captured while “maintaining or regenerating the natural, social and economic capital beyond its organisational boundaries” (Lenssen & Smith, 2019, p. 31). According to Roome & Louche (2016), BMI has four connected stages: (1) identifying a need for change, (2) translating this need to an operational reality, (3) embedding the new capacities in the company and (4) sharing the new capacities to stakeholders for revision (cited in Lenssen & Smith, 2019).

The last practice is *change management*, which is the development of dynamic capability (DC), defined by Teece et al. (1997) as “the firm’s ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments” (cited in Ayuso et al., 2006, p. 477). Managing these capabilities requires a lot of attention today as they have a key role in the sustainability transformation (Lenssen & Smith, 2019). Change management can be linked to innovation management as it also leads to organizational renewal (Ayuso et al., 2006). Companies need the agility to learn quickly, sense new opportunities and threats, and maintain competitiveness through the reconfiguration, if necessary, of the intangible and tangible assets. The managerial talents required for change management are: (1) understanding the context and macro trends, (2) being aware of the complexity of processes, and (3) engaging through a solid network of partners (Lenssen & Smith, 2019).

## 2.4 Sustainable innovation management

Based on all these theories, managing SI does not seem to be a far-fetched concept as IM and CSM have various things in common. Those go from the importance of integrating both of them into the main business strategy (Adams et al., 2006; Maas, Schaltegger & Crutzen, 2016),

to the characteristic of change within a company's organization systems (Adams et al., 2006; Lenssen & Smith, 2019), to the relevance of stakeholders and their integration in the process, being for their knowledge or to create sustainable value (Adams et al., 2006; Lenssen & Smith, 2019). Moreover, both of these management systems emphasize the importance of learning and continuously improving the organizational or operational methods (Evans et al., 2017; Tidd & Bessant, 2018). Finally, both represent great opportunities and can create competitive advantage for companies (Sommerfeldt & Yang, 2017; Glauner, 2018).

Therefore, sustainable innovation management (SIM), which is a very recent concept that has not been developed enough, can be defined as the process of developing innovative products or processes that consider and integrate sustainability considerations with economic, environmental and social goals (Cillo et al., 2019). Although there are three levels of SIM going from product innovation to process innovation, we will only consider the one that assembles all of them, considered the most effective as it induces a systemic, disruptive and integrated change: product, process and organizational innovation. This level creates the biggest impact as it considers SIM as a strategic process, oriented towards the market and being a part of the core business (Adams et al., 2016).

SIM is mainly based on three perspectives that have to be supported by top management and built within the global strategy of the business for optimal efficiency. First, internal management which concerns the implementation of new managerial systems, structures and business models to develop new products or services in a sustainable manner (Cillo et al., 2019). This is related to the business model innovation we have seen above, and the development of DC related to change management. According to Longoni and Caglianon (2018), this has enabled a greater ability to plan on longer horizons, to learn from the past and higher tolerance for uncertainty (cited in Cillo et al., 2019). Second, external relation management that defines SIM systems as a collaborative process involving multiple actors and institutions. This resonates with the stakeholder engagement theory developed above and the consideration of a company being in continuous interaction with its ecosystem. Third, performance evaluation which is the measurement and reporting processes of SIM that involves different indicators regarding financial performance, synergies between stakeholders, environmental externalities and resource efficiency (Cillo et al., 2019).

## 2.5 Managerial competences

Finally, although SIM is more effective when built on a system, there are new skillsets and behaviours that managers need to adopt or develop in order to best deliver the new SI system or business model (Riel, 2011). Not only the behaviour of senior managers is crucial as they are perceived as the leaders of an organization who can motivate employees, but they are also responsible for the implementation and the support of SI (Adams et al., 2006). To develop a great SI strategy, there is a need for a clear vision developed and communicated publicly by the senior management (Wesselink, Blok, van Leur, Lans & Dentoni, 2015). Strong strategic leadership also means a managerial attitude tolerant to change, promoting corporate creativity, innovation and openly supportive of sustainability concerns (Adams et al., 2006; Riel, 2011).

SI also requires some individual skills from managers that need to be continuously activated and improved (Adams et al., 2016). A first competence is *systems thinking*, the ability to detect systems across different domains of the sustainability triangle, being aware of their boundaries and understand how the interactions and interdependencies. Second, *embracing diversity and interdisciplinarity*, which is the ability to acknowledge different opinions and their legitimacy, to facilitate dialogue and the exchange of ideas (Wesselink et al., 2015). It is also about being able to work with people across different disciplines and switch methods and “languages” easily (Schaltegger et al., 2013). Third, *foresighted thinking*, which allows the analysis and crafting of future decisions in order to have a full understand of long-term effects. Fourth, there is *normative competence*, allowing the manager to map and reconcile ethics and principles with the targets. Next, *action competence* or the ability for managers to get personally involved, take responsibility and be pro-active in the improvement of the SI systems. This competence is highly important and very much related to the next one, *interpersonal competence*, the ability of managers to motivate their employees to collaborate and take part in SI initiatives. And finally, *strategic management* which concerns quite traditional managerial skills about designing and implementing strategies and projects; organizing people, tasks and resources; controlling policies and plans; and leadership competencies (Wesselink et al., 2015).

Therefore, according to Wals (2010), SIM being a continuous transformation, change agents and their individual skillsets “are crucial for the development of the necessary flexibility and adaptability of businesses in dealing with new and changing sustainability challenges” (cited in Wesselink et al., 2015).

## 2.6 Conclusion

In this chapter, we have observed that SIM is a very new concept that has not received a lot of attention, although innovation and corporate sustainability management separately have been studied a lot. Through multiple practices related to these two concepts, we have tried to frame the characteristics, the factors and the organizational implications of SIM as well the individual managerial competences required for SIM. There were a lot of common elements between IM and CSM that lead to effective SI, many of which are related to the organizational and managerial barriers we have developed in the previous chapter. However, we also perceived the importance of tools and frameworks that can lead to a better holistic understanding of all the different practices of IM and CSM. Therefore, in the next chapter, we will focus on discovering these holistic frameworks and how they consider SIM as a process that leads to the product, process and organizational innovation mentioned above.

## Chapter 3: Models for managing sustainable innovation

### 3.1 Introduction

Management models and frameworks have become a great tool for managers to visualize and support their analysis and decision-making processes. They represent a combination of interlinked items that have allowed managers to limit uncertainties, facilitate internal strategic communication, support the day-to-day operations and finally help approve or not the different practices for continuous improvement (Budler & Trkman, 2019). These models can therefore support the SIM practices by helping managers to better understand and implement SI. In this final chapter, we will look at the different models that have been established by the current literature, check how they integrate the different practices of SIM established in the previous chapter and compare their functioning with one and other.

### 3.2 Dynamic capabilities models of management

The first category of these managerial models is the one that highlights the organizational management of companies' DC, which according to Darmani et al. (2017) is a way to “determine their ability and willingness to implement changes into their process to contribute to transitions towards a more sustainable industry” (cited in Mousavi, Bossink & van Vliet, 2018, p. 224). These capabilities also allow companies to more easily develop new products and services for sustainability and successfully bring them to the market (Iles & Martin, 2013).

On one hand, we have a model developed by Mousavi et al. (2018), which is based on the three capability clusters presented by Teece (2007): sensing, seizing and reconfiguring. First, *sensing* is about gathering knowledge and information on external elements like customers' needs, competition, suppliers and technology in order to understand the current challenges and identify profitable and innovative solutions to environmental problems. Second, it is about *seizing* the right opportunities identified previously by implementing new products, services or business models and mobilizing the right resources and assets accumulated through continuous learning and relevant partnerships. Finally, *reconfiguring* capabilities, according to Teece (2007), allow the constant renewal of resources and competencies in order to proactively prepare for the future and respond quickly to a “variety of unpredictable contingencies and demand changes” (cited in Mousavi et al., 2018, p. 227). Another assumption in this model is the one from Eisenhardt and Martin (2000), that the three DC occur through organizational

routines in companies (cited Mousavi et al., 2018). Therefore, this model presents the most relevant underlying organizational routines and how they interact with each other in order to help companies with the increased complexity of managing innovation for sustainability.

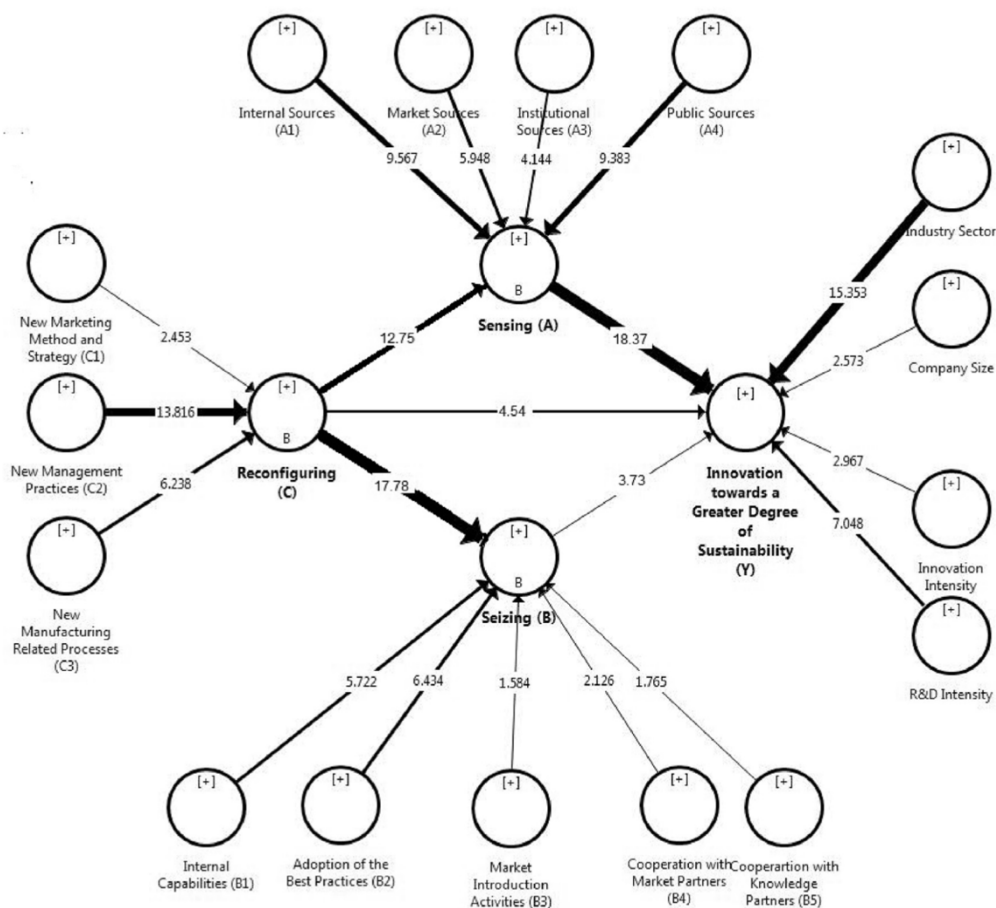


Figure 1: The dynamic capabilities and their underlying organizational routines

Source : Mousavi et al., 2018

Based on a quantitative research, this model demonstrates the effects each of the capabilities have on SI: seizing and sensing have a direct positive impact while reconfiguring can have a direct or an indirect effect, mediated by the other two capabilities (Figure 1). The three most important effects that they observed are the ones of sensing capabilities on SI, reconfiguring capabilities on seizing capabilities and the importance of the industry sector on SI. Regarding the most relevant routines, sensing capabilities are mainly developed through explorative activities that help identify and generate new knowledge and there are four types of information sources that have an effect: internal, market, institutional and public sources. According to their research, internal sources are the most useful as they are often related to environmental management processes or audits that have great value in terms of knowledge and issues management. Seizing capabilities involve developing internal capabilities such as employee

training and R&D activities, adopting the best practices in the sectors, introducing new activities on the market, and cooperating with partners from the same market or using the same knowledge. According to this model, adoption of best practices and internal capabilities, especially employee training that provides the best SI performance, are not only a way to transfer technological knowledge but it is a great way to increase awareness around the sustainability challenges. Moreover, they found that cooperation with external partners and co-innovating with them has greater outcome than the simple introduction of innovation to a market. Finally, although reconfiguring capabilities can be influenced by new marketing methods or manufacturing processes, the most impactful organization routine is about the new management practices. These include “new business practices for organizing procedures, new methods of organizing work responsibilities and decision making, and new methods of organizing external relations with other firms or public institutions” (Mousavi et al., 2018, p. 235).

On the other hand, we have a framework developed by Inigo and Albareda (2019) that explains the organizational dynamics for managing SI, based on the theory of DC. After a qualitative research, they developed an evolving multi-layered framework that provides new insights on how companies that adopt SI practices and processes are contributing to their own DC in order to stay innovative.

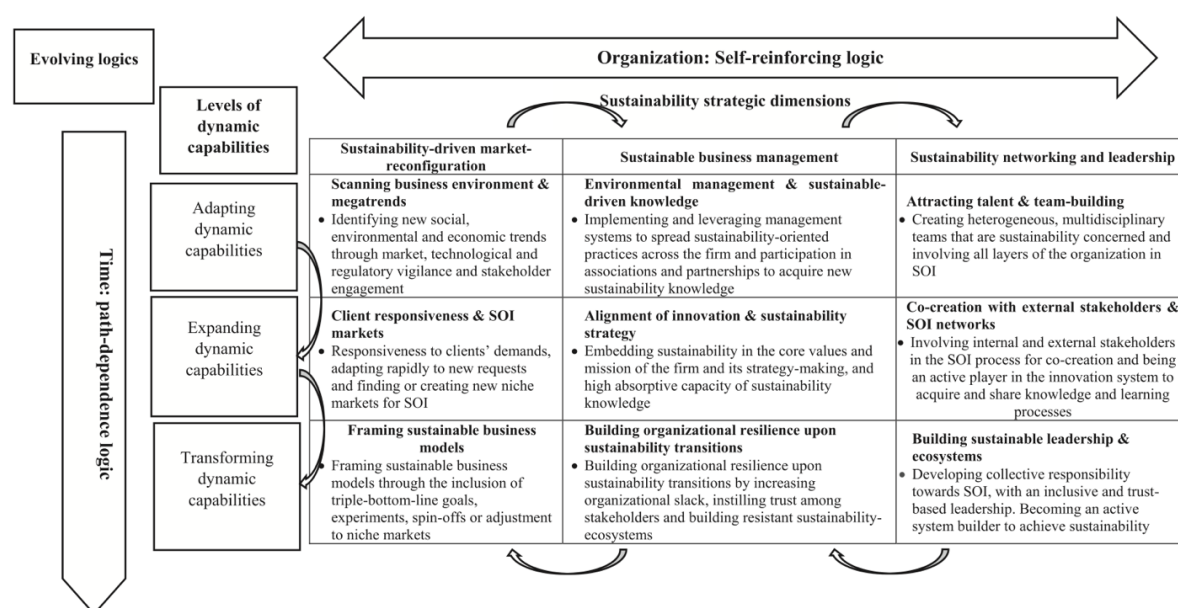


Figure 2 : A capability-based view of SI

Source: Inigo & Albareda, 2019

This model is built on a slightly different classification of the three DC levels but it maintains the same principles: (1) *adapting level* involving continuous adjustments and incremental improvements to the existing routines ; (2) *expanding level* concerning more advanced initiatives and a renewal of the current organizational capabilities; and (3) *transforming level* which happens when a company reconfigures its previous processes and transforms its systems. Then, these levels are applied to the three SI strategic dimensions that this paper has discovered: (1) *sustainability-driven market-reconfiguration*; (2) *sustainable business management*; and (3) *sustainability networking and leadership* (Inigo & Albareda, 2019).

Therefore, this framework is based on a box of nine elements that enables successful SI management through different layers of complexity and intensity (Figure 2). The first column that is driven by new market-based opportunities goes from scanning and identifying new trends, to innovating closely for the main customers and even co-creating with them, to finally completely transform the business model into a sustainable one based on a very intense learning process with their external environment. The second column that involves the integration of SIM tools starts with new knowledge management and the introduction of environmental systems into the company, then follows with the integration of SI into the main strategy, and then ends up with the development of processes that frame organizational resilience to change. The third column concerns the management of a larger system transformation for sustainability goes from developing a sustainability-oriented human capital, to collaborating with multiple stakeholders during the SI and value creation process, to finally building a strong sustainable leadership which promotes SI values, creativity and intrapreneurship (Inigo & Albareda, 2019).

Finally, the last elements of this framework concern the logics behind the evolutionary cycles and the interconnection that exist between these elements of SIM. The first is path-dependent logic which explains how dynamic capabilities are built on each other and therefore how each company has different speeds of variation and rates of adaptation. Early stages of SIM are synonym of adapting capabilities, slow improvements that will over time evolve into expanding capabilities, depending on the pace of capability-building and other variables like company identity. Transforming capabilities are also an evolution of expanding capabilities, however, this link is less observed by this paper, as not a lot of the companies from their sample have developed these much more complex and radical capabilities. The second logic is about the self-reinforcing character of this model as the three levels of the DC are interconnected with the three strategic dimensions and they evolve together. This interconnection, based on

feedback and learning, generates a virtuous cycle of greater organizational complexity and effective SI strategies and processes (Inigo & Albareda, 2019).

Both of these models are based on the DC theory and want to guide managers to identify the most relevant practices to implement successful SI strategies. The first model is much more interested in understanding the basic relations between the capabilities and their organizational practices whereas the second model offers a more detailed framework that integrates a more dynamic approach to SIM. These models have mentioned many of the elements developed in chapter two, like stakeholder's integration in the process, knowledge and issues management, organizational culture and innovation strategy. And they have also introduced new ones like organizational resilience towards change (Inigo & Albareda, 2019) or developed more deeply existing ones like people management with employee training (Mousavi et al., 2018), talent management or the creation of multidisciplinary teams (Inigo & Albareda, 2019).

### 3.3 Sustainable value creation and design thinking models

This second category of models places the emphasis on sustainable value creation, sustainable business model innovation and design thinking (DT). As we have seen in the first two chapters, sustainable value creation is at the heart of SI as a business strategy, is heavily linked with business model innovation in terms of SIM and has led to SBMI in terms of corporate practices for SI. According to Young (2010), DT is a human-centred iterative approach that encourages an analytical mindset, holistic reasoning and creativity in order to frame and solve problems (cited in Shapira, Ketchie & Nehe, 2017). This approach is a great way for companies to adapt or reinvent their business models (Altenburger, 2018) and foster an open-minded culture towards innovation and interdisciplinarity skills (Shapira et al., 2017).

The first model was developed by Baldassarre, Calabretta, Bocken and Jaskiewicz (2017) where based on a qualitative research, they created a process for sustainable value proposition design, a new practice that combines SBMI and user-driven innovation. This model is about sustainable value proposition (SVP), which according to Bocken et al. (2013) is a value proposition that includes the needs of multiple stakeholders into its business value and is the core element of sustainable business models (cited in Baldassare et al., 2017). The main idea of this process is the fact that SVP can be “designed through an iterative process involving three activities” (Baldassare et al., 2017, p. 17).

The first activity is about *talking* to the network of stakeholders in order to identify and discuss about the elements of the SVP (Figure 3). The main goal is to detect the most relevant issues, with multiple perspectives and discovering hidden connections and opportunities. This activity can also lead to a complete reconfiguration or expansion of the stakeholder network in order to create the most relevant sustainable value (Baldassare et al., 2017).

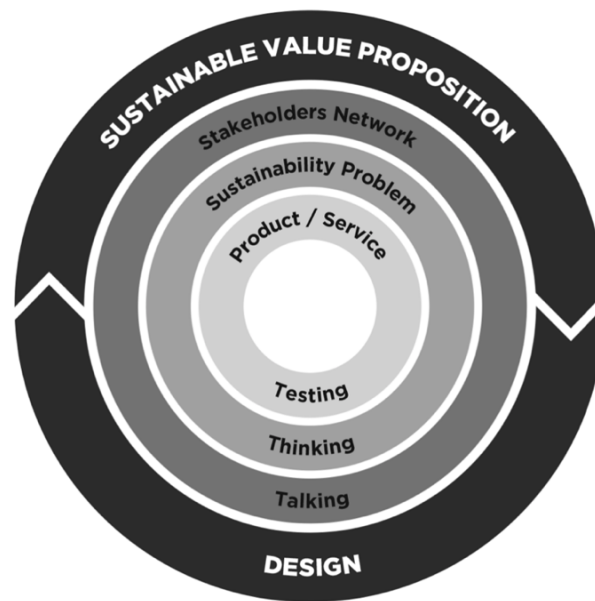


Figure 3: Process for sustainable value proposition design

Source: Baldassarre et al., 2017

The second activity concerns the *thinking* of the sustainability problem, or when the original SVP is updated based on the new knowledge from the stakeholder feedback. This takes place through problem reframing and brainstorming where the outcome of this activity is a larger problem frame and a new innovative product or service that brings an answer to it. Finally, the third activity is *testing* the product/service in order to verify that it delivers effective shared value throughout the network of stakeholders. This activity is based on a minimum viable product whose features will be tested and results will be measured carefully in order to gather validated learning. This whole process is dynamic and iterative as it aims to help managers creating sustainable value through an animated understanding of stakeholders, continuous experimentations and iterations (Baldassare et al., 2017).

The second model is from Shapira et al. (2017) which created an integrated sustainable DT process that can help managers with the complexity of strategic SI. Based on a qualitative research, they modified the original DT process by taking into account the ecological and social

boundaries while keeping the original systemic and holistic perspective. This process is divided into 6 steps that happen in chronological order but with constant iterations during the whole process.

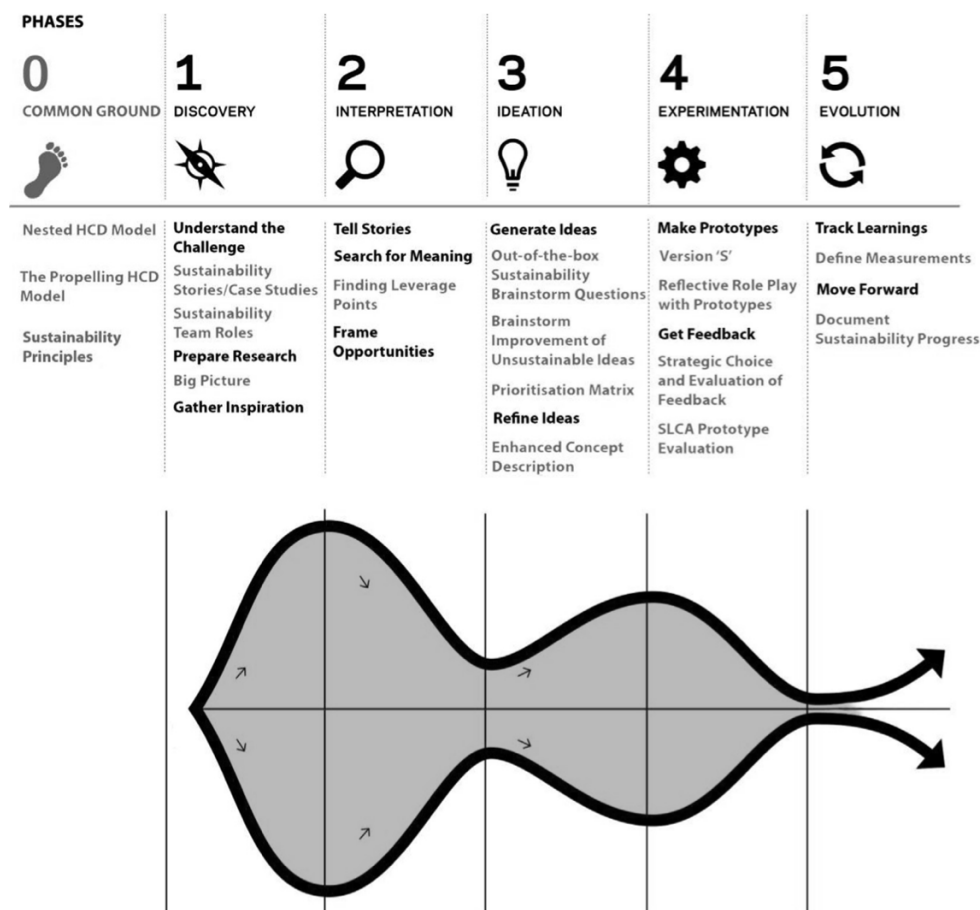


Figure 4 : The integrated sustainable design thinking process

Source: Shapira et al., 2017

First, a pre-phase called *common ground* which ensures a shared understanding of the sustainability concept and how it interacts with feasibility and viability. Second, the *discovery* phase or the moment when the design team defines the new challenge through intensive research, stakeholder mapping and divergent inspirations. After this enlargement of information comes the third phase, *interpretation*, where the team converges this new information into meaningful insights in order to frame the most interesting opportunities and leverage points. Then, during the *ideation* phase, there is a new diverging effect as the team brainstorms in order to generate as many ideas as possible according to the relevant opportunities found before. According to their research, this step is the most important one as finding sustainable and innovative ideas is complex and there is a real need for practices such as out-of-the-box thinking, prioritisation matrix and finding solutions to unsustainable ideas

through a new lens. The next step is *experimentation* which comes with a new convergence as the team will select the few ideas to experiment, make a prototype, test it with the relevant stakeholders and gather feedback. And finally, the *evolution* phase involves relevant measurement settings, monitoring the evolution of the solutions regarding the sustainability goals, tracking the new learning and integrate continuous feedback from stakeholders. This process involves also, throughout every step, sustainability storytelling to inspire and motivate the design team, and systems thinking to spur the team to always try to see the bigger picture behind every idea and problem (Shapira et al., 2017).

These two models are based on the DT approach that helps companies to face new challenges by reconfiguring, innovating their business models and value propositions and having a deeper understating of the current issues and stakeholders' needs. These models are iterative as they put high emphasis on feedback and prototype testing. Both of them present processes that lead to SBMI and they have mentioned many of the elements from chapter two such as stakeholder, knowledge, project, inputs and issues management, business model innovation and innovation strategy. They also brought new elements such as experimentation through prototypes, systems thinking, and an introduction phase about sustainability principles to start brainstorming and idea generation on common ground (Shapira et al., 2017).

### 3.4 Conclusion

Throughout this final chapter of our literature review, we presented four different management models and frameworks outlining multiple practices that we have described in the previous chapter around the process of managing SI. The two main approaches for these models were the dynamic capabilities and the design thinking theory. Each model emphasized on the dynamic and iterative process of SIM but each time considering it only through the lens of one theory or one organizational practice but not through a holistic approach. Moreover, each model emphasized on some of the organizational practices of managing SI but did not include the individual implications regarding the managerial competences we have found in the previous chapter. Finally, the only model that clearly mentioned the concept of SIM was the second model from Inigo and Albareda (2019), whereas the others simply explained management processes combining sustainability and innovation. This is probably inherent to what we have stated previously about SI and SIM being very recent concepts, where the literature still has not developed a general model for it.

Therefore, after reviewing the literature in order to better understand SI and its management processes and implications, the clear objective of this paper is starting to appear regarding the research motivation. As SIM appears to be a fairly recent concept, with not clearly defined organizational practices, and a set of individual managerial competences that exist separately from those practices, our objective will be to clarify this concept by developing a holistic model of SIM and bring answers to the following research question:

*How do the organizational practices and individual competences enable sustainable innovation management?*

The answer to this question can be broken down to two parts: (1) identifying the main SIM organizational practices, and (2) the main individual managerial competences. The main goal is to develop a model that will explain these two elements as well as the interactions and relations between them and how they can lead to SI. This model will bring more clarity to the concept of SIM regarding the organizational implications as well the ones concerning the SI managers individually. Based on the confrontation between our theoretical and empirical findings, this holistic model aims to help managers understand what practices but also what competences lead to SI and the dynamics and interconnections hiding behind SIM as an integrated process.

## **PART II: EMPIRICAL RESEARCH**

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### **Chapter 4: Methodology**

#### 4.1 Research design

Regarding the objective of our paper stated above, we will proceed to an exploratory study, with an inductive approach to realize a qualitative research.

The aim of this thesis is to have a better understanding of a fairly new concept that is SIM and the different managerial practices related to it. Due to the main aspect of discovering a new view on SIM, the nature of this paper will be exploratory (Saunders, Lewis & Thornhill, 2015). We are mainly on a quest to discover the relations and dynamics behind SIM, based on the literature and on how it takes place in companies right now. There are a lot of theories about SI, the advantages, the barriers and there are also frameworks and models explaining innovation management and sustainability management. However, there are no integrative models or theories about the management of SI from an organizational and individual standpoint. This exploratory study will be based on some elements we have found in the literature review, that will be confirmed or not through our research, and also new elements from our data collection. At the end, we will represent the findings of our quest by a model about the managerial processes of SIM; a model that will help us to better understand this concept.

In order to answer our research question, we will adopt an inductive approach, that is very typical for exploratory studies (Saunders et al., 2015). Indeed, the inductive approach is when the research starts by collecting data to explore a phenomenon and then it generates or builds a theory (Saunders et al., 2015). In our thesis, based on our observations from our data collection, we will build a more general model to explain SIM and to answer our research question. We will draw a meaning from our interpretation of the results and define a general process for SIM. Although, our model will be holistic, we do not have the pretention to discover a general truth or to develop a model that will help every SI manager in the world. Our objective would rather be to bring a new light on elements and links that weren't highlighted before and guide managers on what elements they might need to develop more regarding specific outcomes.

Finally, we have chosen to follow a qualitative research strategy as we will collect and analyse non-numerical data in order to answer our research question. To better understand the managerial implications of SI, we think direct and in-depth insights from current professionals who manage SI and who have experienced the transition of their companies towards SI might bring more relevant answers to our research question than quantitative data (Gill, Stewart, Treasure & Chadwick, 2008). Therefore, the model we will develop will be based on these individual experiences and their confrontation to the theory that we have gathered in the literature review.

## 4.2 Data collection

From the multiple methods that exist to collect qualitative data, we have decided to conduct individual semi-directive interviews on a sample of six managers that we have selected on a basis of various criteria.

Semi-structured interviews are a type of research interviews, one of the most common methods to collect data in a qualitative research (Saunders et al., 2015). These consist of “several key questions that help to define the areas to be explored, but also allows the interviewer or interviewee to diverge in order to pursue an idea or response in more detail” (Gill et al., 2008, p. 291). The main advantage of these interviews is to explore the experiences, beliefs and motivations of individuals on a specific phenomenon that might lack of sufficient literature around it or that requires in-depth insights from individual participants (Gill et al., 2008). For the nature of our study, which is exploratory, this is even the most relevant method for collecting data (Saunders et al., 2015). We have created our own semi-directive questionnaire (Appendix 4) with a set of open-ended questions to have as much as possible unaffected opinions but still to orient the discussion around what was previously discussed in this paper. We began by an introduction to state the subject of our thesis, the framework and the objective of our research, as well as an explanation of how we will proceed for the interview. This was done in order to inform the participants and let them prepare themselves for the one-hour discussion. Then, we followed by the main structure of our questionnaire that we divided in four parts driven by four objectives: (1) how SI is defined in the company, (2) what organizational practices define their management of SI, (3) how this management can be improved based on the current challenges, and (4) the managerial implications related to this specific individual participant. Although we divided our research question in three parts, in

this questionnaire we felt the need to talk separately about their current managerial practices and how those could be improved in the future. We have concluded the interviews by asking for any possible ways to improve this interview and asked them about their confidentiality preferences. Therefore, we have proceeded by a “funnel” approach as we have started with an introduction and then general questions about the interviewees to put them at ease and gain their trust, and then we got more and more to personal and precise questions to understand their opinions and point of views on the matter (Léger- Jarniou, 2016).

As this approach comes with a certain flexibility, we have tried to follow the questionnaire structure for all interviews and adapted the questions based on the situation and the previous answers of the interviewee. We have also modified some of the questions as time went on as we have seen that there was confusion for some parts. All interviews were conducted between June the 23<sup>rd</sup> and July the 10<sup>th</sup> 2020 and were all, due to the ongoing situation generated by Covid19, made remotely through telephone or videoconferences. Once authorized, each interview was recorded, later on transcribed in the form of verbatim<sup>5</sup> and submitted to the participants for validation.

Due to the choice of our research design, as the inductive approach leads to a reasoning that is “likely to be particularly concerned with the context in which such events take place, (...) the study of a small sample of subjects might be more appropriate than a large number as with the deductive approach” (Saunders et al., 2015, p. 147). Therefore, we have conducted six interviews on managers from six different companies who were selected based on three specific criteria. These criteria also limited the number of interviewees as they were quite selective and we also, after six interviews, have met a saturation in many of our results.

### *Function*

We were looking for managers, officers or directors who occupied a function related to SI and could talk about their managerial practices. The profile chosen for the interview were people who had a direct contact in management or in strategy and who could tell us about their experiences around the SI processes and practices in their company. Our search was made on LinkedIn where we only contacted people who either had sustainability and innovation in their function title or who have occupied, in the past, positions related to one of the two concepts

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<sup>5</sup> A word-to-word transcription of a speech.

and who now had the other concept in their current function title. For example, interviewee n°3, who is currently at the head of an innovation digital strategy team at AXA, had previously been at the head of the corporate sustainability department.

#### *Company size*

Another criterion was the size of the company as we were only interested to interview professionals from large sized companies. According to the OECD (2020), one of the most common criteria to determine the size of a business is the number of employees and an enterprise is considered large when there are 250 or more employees. This criterion was important for us because we are especially interested in the management of big organizations, with many different levels, who might have bigger challenges in their transition towards sustainability than smaller companies or start-ups. Therefore, before contacting each potentially relevant participant, we verified quickly the company's website for the number of current employees.

#### *Company's motivations*

Finally, we also have selected companies who are committed to sustainability-oriented goals and who have developed specific strategies around that. That criterion may seem to be related with the first one however, we have come across sustainability or innovation managers who worked in big consultancy companies and once we have looked on those company's websites, we did not find any sustainability or innovation objectives. We therefore made sure that each of our participants were working in companies who put those concerns among their priorities and who had, for example, an integrated sustainability report.

The six interviewees come from Recticel, Engie, AXA, Procter & Gamble, Spadel and Levi Strauss. The information concerning the interviewees and their companies, regarding each criterion, is presented in tables in the appendices<sup>6</sup>.

### 4.3 Data analysis

As we have detected similar patterns and themes already after conducting the first two interviews, we've decided to do a thematical analysis, one of the approaches of content

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<sup>6</sup> From appendix 7 to 17.

analysis, that is a “method for identifying, analysing, and interpreting patterns of meaning (‘themes’) within qualitative data” (Clarke & Braun, 2017, p. 297). Through a horizontal approach that consists of identifying the recurrent elements between all the interviews, we have created a coding system for the two main parts of the research question (Gavard-Perret, Gotteland, Haon & Jolibert, 2018). We built this coding system after a first lecture of all the interviews where we deconstructed the individual discourse of each interviewee in order to search for common phrases and expressions regarding each part of the research question (Gavard-Perret et al., 2018). After detecting all the common concepts, we then tried to aggregate them in relevant themes based on the general idea given by the interviewees, our impressions and also the questions to which these concepts appeared as answers. In this thesis:

Codes are the smallest units of analysis that capture interesting features of the data, potentially relevant to the research question and they are the building blocks for themes, larger patterns of meaning, underpinned by a central organizing concept - a shared core idea (Clarke & Braun, 2017, p. 297).

Although we are searching for common concepts or codes, we are not searching for common ideas and we will also analyse the divergences. Thus, we will show how the same concept is not considered the same way from one interview to another. We have proceeded like this for the two main parts of the research question, so we have created two coding systems. First, we have created a coding system based on the SIM practices where we detected more than twenty codes based mostly on the interviewees’ answers to the second and third part of our questionnaire which we aggregated in six themes (Appendix 5). Second, the managers and officers’ answers regarding their skills, mindset and personal evolution have led us to three themes for the managerial implications (Appendix 6). These themes will be the structure for the next part where we will present the results of our qualitative research, which will be illustrated by direct quotes from the interview transcripts.

According to Gavard-Perret et al. (2018), a thematical analysis does not imply to interpret every data from the interviews. Therefore, we only analysed what we determined as relevant based on the themes that have emerged after our coding system. So, our analysis depends on our interpretative skills that we tried to regulate through a systemic and organized framework which are our coding systems. These were created through an iterative approach, meaning that our themes were clearly defined only at the end of our analysis as new data would provoke

major changes. Through these two elements, we want to make our analysis reliable, which is a characteristic that determines the quality of a research (Saunders et al., 2015). Reliability depends on a structured methodology that allows any researcher to obtain similar results from the same data in order to limit the individual interpretation by a systemic approach (Gavard-Perret et al., 2018).

## Chapter 5: Results

### 5.1 Introduction

In this chapter, we present the results from the thematical analysis that we have made on the six interviews. Throughout our research, we wanted to understand the way SI is being managed today in large companies, at a corporate and an individual level, the individuals being the SI managers. Here, we expose the elements through which we will be able to answer our research question. The quotes come from the transcripts of the interviews, available in the appendices<sup>7</sup>, five out of six interviews were made in English, and the direct quotes from the interview made in French were carefully translated by us in order to remain very close to the original sentences. We first present the organizational practices that characterize their SIM and then the main individual competences that have emerged from managing SI.

### 5.2 Key organizational practices for SIM

None of the companies we have interviewed has implemented a management model describing the SI practices and processes managed in the company. Moreover, even though each company is committed to SI, not all of them have integrated it the same way into their structure. However, despite this lack of clear framework, the management of SI does not seem to differ a lot from a company to another. We have found six major components that emerged during the interviews regarding each company' SIM practices and processes.

#### 5.2.1 *Business model innovation*

Considered by all of our interviewees as the main challenge when it comes to SIM, innovating the business model represents one of the main elements of sustainable innovation management. Whether it being under the form of re-thinking and re-designing the whole model or embedding the new goals into the core strategy or even developing an ability to be fast and flexible to adapt the current business model. As stated during interview n°4, SIM is actually “not about a different process (...) but it is certainly a very different way of innovating the business model and I think BMI would be the one element that really is the biggest challenge in terms of how we have to think about things”.

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<sup>7</sup> From appendix 8 to 18.

DT is one of the approaches used by many of the interviewees to offer new products or services tailor made for their customers and “enrich the value propositions” (interview n°3). This is characterized by a framework that wants “to be innovative and to be iterative in order to try to be close to the customer” (interviewee n°3) and where there is a “need to see the whole and to be very human-centric” (interview n°4). According to interviewee n°4, the big objective behind this approach is to bring “new source of values to the customers”, that are more than just “cutting-off” options, by connecting to the market trends and understanding how they “are more sensitive to the origin of their products, to the carbon footprint” and so on. This often happens through an “ideation process” (interviewee n°3), that is a typical method in innovation based on developing minimum viable prototypes, “testing very early on with the customers”, and also testing the “feasibility and the viability” (interviewee n°5) of the idea, so how can this idea be operationalized in the company and commercialized on the market. For many of the companies we have interviewed, new sustainable value has appeared under new service-oriented value propositions, centered on the customers’ needs. According to our interviewee n°2, Engie has shifted towards “a service business model” where “it is all about energy efficiency services, setting up new infrastructures, helping clients manage their energy use rather than just selling a quantity of energy to the client”. AXA is also trying to improve the quality of its services in order to improve “sustainability, transparency and trust” (interviewee n°3) as well as Recticel, who has a new project of customizable mattresses in order to prevent overproduction.

Circular economy processes are also a major part of BMI. Indeed, re-thinking the business model and making it sustainable goes with “a total system change across the value chain” as said by interviewee n° 4. There is a need to re-design the whole process of the production, the consumption and the end-of-life of a product and making this process as circular as possible is a common approach for many of the companies we interviewed. This can take the form of: developing a re-usable water technology system that makes the production step circular in Levi’s factories, reinventing the concept of packaging at Spadel, collecting and recycling the used diapers into fertilizers at Procter & Gamble or switching to plant based renewable materials as well as taking back and recycling old mattresses into acoustic insulation foams at Recticel. Based on our interviews, it appears that this circular element is much more common for companies that produce goods; however, this might be linked to our interviewees’ business units and specific functions.

These changes regarding the business model and the integration of sustainability inside the company's processes have to be completely embedded into the whole business strategy of the company. According to the interviewee n°5, the best way to integrate sustainability into the business, "it is entering by the pole of innovation", as innovation might already be a pillar of the global business strategy. That can be represented by emphasizing a lot on technology and research, dedicated to creating new sustainable processes, products or packaging. An example being Levi's that has built a strategy around innovation being a motor and a support to sustainability, through unique technologies that have a high impact on reducing the water usage or the carbon footprint during the production process of their apparel. Another way to embed SI is to set big business commitments that serve a sustainable goal so if sustainability fails, the business fails too and vice versa. This transforms SI from an "option, with an opt-out possibility" (interviewee n°4), to a necessity. Procter & Gamble have declared their commitment to "deliver responsible consumption through all their brands from 2020 to 2030" (interviewee n°4) and by doing so, they have put a big corporate and sustainable ambition at the center of the business strategy. Recticel has also made SI into its main pillars regarding its business strategy with specific goals and objectives to achieve each year. In a similar way, AXA's CSR department have defined a specific CSR strategy at a corporate level with specific objectives for every department:

We had to work with all the different lines of business with the different expertise, from finance to investment to data to procurement to HR to innovation, in order to define what the CSR objectives would be for the different areas of the business to have this holistic 360 view of CSR. (Interviewee N°3)

That process can actually be defined as the design of SI within the strategy of the company. It is an essential part for many of our interviewees as it gives credit to SI and validates the new business model on the long run.

Finally, a last concept that emerged from our interviews was to be flexible and be able to adapt the business model quickly and frequently if needed. This can take the form of the lean start-up methodology, like at AXA or Procter & Gamble. At the latter, they have developed a method to become more and more capable of finding the best solutions to "very laser-focused "killer" questions or problems » in a very short period of time which is called "growth-works capability" (interviewee n°4). Following the same method as start-ups who are very lean on

budget and time, they are managing fast-cycle experimentation through the “test-learn-iterate-launch” (interviewee n°4) principle in order to be able to face the constantly changing environment. Agile ways of working are also more and more developed in innovation teams at AXA, Engie and Procter & Gamble, however, they are more implemented among the innovation processes rather than the SI ones as for now. These are working practices that a company uses to empower its people to work “where, when and how they choose, with maximum flexibility and minimum constraints, to optimize their performance and to do their best work” (BCS, 2020, p.6). Although flexibility seems very well framed in larger companies, it is considered as a huge challenge in smaller ones like Spadel or Recticel. The first company encounters great difficulties to create frequently new business models due to a high-risk aversion whereas the second one is struggling with implementing the new business models regarding the company’s mindset towards disruptive innovation.

Therefore, even though there is a common need in all the companies to re-invent their value propositions all along the value chain and “to be very bold in terms of out-innovating the business models” (interviewee n°4), due to the fear that their “business is going to fall through ground like Nokia or like BlackBerry or Kodak” (interviewee n°3), BMI is not an easy process. It is also an element of SIM that is very difficult to isolate and to look at on its own, as most of our interviewees usually linked it to another factor: the cultural mindset of the company’s regarding change.

### *5.2.2 Cultural change management*

In order to embed the new goals and practices into the company’s main strategy, it is crucial to have a strong corporate culture that conveys the right values from the start. To put SI at the “heart of the culture” is creating a mindset shift where it is not just a few people’s job, it is “everyone’s job all the time to be thinking about it” (interviewee n°6). According to our interviewees, managing SI is a lot of the times related to people and change management, that can take the form of a strong vision from the top, educating employees as well as enabling them to be creative, independent and provide them a safe environment to innovate and to care for sustainability.

This transformation of the mindset has to come from and be supported by the top management. It has to be a strong vision around SI that inspires the employees, gets them excited and also

shows that the whole company is devoted to the cause and cares about the sustainable values. As an example, we have Procter & Gamble with one of their strong mottos “Force for Growth and a Force for Good” (interviewee n°4). There is also Levi’s whose CEO, back in the eighties, was a pioneer in social fights regarding LGBTQ+ rights and had created a huge corporate culture around integrity, or their current CEO that brought the values around environmental responsibility into the company culture too. And we also have Spadel, who has created a special platform called “Source of Change” in order to “involve top management and communicate internally and externally on the company’s commitments” (interviewee n°5) and actions around SI, especially regarding its packaging. Creating a vision and communicating on the objectives and values is also key to create sustainable businesses and stop considering SI as a trade-off which will create the mindset shift necessary for building the right strategy for SIM. As stated by interviewee n°3:

If you do know why you're doing something and that's where your vision, ambition and strategy comes in, it's easier to know what you're willing to compromise or to push to get there, and than to push it down to your teams, and even at a project level.

So, enabling opportunities for SI comes from a good communication and strong values. It also can be stimulated by a continuous support from the management regarding creativity, failure, autonomy or by the creation inside the company of a safe place for ideas. The continuous support is often through the big values of the company that allows its employees to be bold, to care for specific matters and to dare to take initiatives to organize a brainstorm session on a cause that matters to them, like environmental or social rights. In the case of Levi’s that might be linked to the fact that:

80 % of the company still belongs to the original family who created the company, (...) it’s not only managed by investors, so the values and the stance we are taking are so important to them, we can keep developing them. (Interviewee N°6)

Another support can directly come from the managers, who are open to creativity and innovation and therefore let their employees to “have the liberty to try things” and take “a couple hours a day to work on something else, that is not in their job description, but that could be bringing value to the company” (interviewee n°2). This also creates a relationship of trust and respect between the managers and the employee, which added to the creativity and freedom aspect, is a key driver of innovation. Finally, another aspect related to continuous support can

also come from the autonomy and freedom given to employees to change jobs and functions inside the company frequently in order to develop transversal skills. According to interviewee n°3, many of our interviewees, managing SI has to involve and connect “people that know about the business or are seen as experts, but they can also understand innovation and sustainability”. And this can be achieved much more easily when the company values “transversal project management skills” (interviewee n°3) and “flexibility in the mindset and in the job” (interviewee n°4). So, SIM is also about upscaling people, train them to get new skills in order to help them become transversal in their work.

To create a specific place for innovation and ideas is also a common approach among the companies we have interviewed. Many have developed an internal incubator in order to help innovative projects “getting launched in a team or with a couple of people from across different teams” (interviewee n°2) like the Water House Lab at Spadel, the EurekaLab at Levi Strauss, AXA’s Kamet or the Engie Incubator. According to interviewee n°2, these incubators are safe spaces that provide the necessary resources, “in terms of people, in terms of time, in terms of money, in terms of consultants and in terms of networking” in order to boost innovation and even sometimes “scale it up outside of the company” if the business is does not fit with the company. At AXA, this internal incubator is more dedicated to investing in future start-ups, part of AXA Group Innovation, that provides AXA’s expertise to support disruptive innovations. Another dedicated place for innovation comes through events and ideation workshops that stimulates creativity and problem-solving skills. At AXA, workshops are very common especially for developing prototypes in the innovation processes, whereas Engie’s Hackathon, Innovathon and Innovation competition are the three big events organized during the year for employees where the company shows its support and gets its people to think about new ideas, as explained by interviewee n°2:

For the competition, the projects are evaluated on four criteria, one of them being sustainability, and there are also many project categories, one of them being best failed idea. This is a way for us to encourage innovation and to get people to be proud of trying and saying it's not a big deal if you fail.

Finally, the last part of creating a mindset shift in the corporate culture is through educating the employees about sustainability matters from the moment they are hired at the company but also the current employees or even investors who might not know the importance of

sustainability and how it can be embedded in the strategy. This can take the form of roadshows, like at Recticel, that have the objective to “really bring all people's minds into sustainability thinking and setting” (interviewee n°1) and raise awareness on the opportunities SI can bring. It is also the webinars that Spadel has decided to launch in order to explain concepts like carbon neutrality and decarbonization to all the company’s stakeholders, going from employees to investors. And it is also what interviewee n°2 has launched at Engie called School of Sustainability©, an internal “formal education program of six days focused on training Engie employees on how sustainability is linked to innovation” (interviewee n°2), and how systemic change and new business models can serve the sustainability challenges.

Therefore, the corporate culture management around change is a major element of SIM. It has become a top priority for many companies over the past decade and it is still an ongoing battle for others as it is mainly people management and changing the mindset of the employees who are not used to sustainability concerns.

### 5.2.3 *SI performance measuring*

A strong element of managing SI that is absolutely essential as it gives a rigorous framework is the development a good measuring system of the sustainability but also of the innovation performance. Metrics are necessary for the integration of SI into the strategy in order to set specific and clear targets, evaluate the quality of a project based on these targets, “incentivize people in the project teams” (interviewee n°3), monitor the progress that has been made and display in a transparent way the commitment of the company towards sustainability and innovation. Defining what are the metrics for success and choosing what sustainability goals are based on has to “make sense for the global strategy” (interviewee n°3) in order to have a real impact on society while being feasible and to motivate the employees. Once the metrics are chosen, a very common way is to use them to “rate and evaluate the new projects” (interviewee n°2) and make strategic choices regarding the main strategy. These metrics are also a great way for companies to do their self-assessment, to determine whether they have performed well or not over the time by using the “best tools, processes and systems again to track and measure the progress” (interviewee n°4). They can also compare their performance to “CSR rating agencies’ performances (...) like the Dow Jones sustainability index” (interviewee n°3). And these metrics can finally be a great way for companies to prove their commitment towards SI with concrete elements and show how they define their own

performance. There seem to be three approaches for the measuring system among the companies we have interviewed.

The first approach is the creation of a unique index system, built on a set of KPIs relevant for the company. Usually, it is a sustainability index that is based around the triple bottom line or the three Ps, people planet and profit, “where for each P there are a set of criteria defined by the company” (interviewee n°1). Building this index can be complex as, according to interviewee n° 1:

You can have a very green, sustainable project with less profit that has the same score as a very profitable project, but with less sustainability content. We got profit out and we are assessing only people and planet. And profitability, we are keeping separately.

This index most of the time is a ranking tool that is used for decision-making by the top management, like at Engie or Recticel. The latter also uses it as a tool for prioritization as “not all criteria are weighted equally” so it allows them to prioritize some KPIs like waste management or energy consumption.

The second approach is to have a specific set of models to measure and assess specific KPIs. For our interviewees that especially related to the carbon footprint measurement, the life-cycle assessment of products or sometimes also for more social KPIs like “education, training and legal compliance” (interviewee n°1). This approach is used for scanning and measuring the company’s performance on relevant KPIs, like at AXA, Engie, Recticel or Spadel, where every three months a set of indicators show progress. It can also be used to determine the business strategy around SI by detecting the most relevant KPIs, like at Levi Strauss where they realized a few years ago that for a pair of jeans, they needed more than 3000L of water. After that, they built a new business strategy to handle this issue, like the development of a bunch of waterless technologies to use less water on all the lifecycle of a jean or “working with other materials that require less water than Demin, like hemp” (interviewee n°6).

Finally, a third approach is the stage-to-gate project management, that is combined with a sustainability index or with a simpler measuring tool. This type of project management is a “classical process in innovation” where every step of a project from “ideation, to the feasibility study, to development and to launching” (interviewee n°5) is linked to a set of decisions to

make in order to continue the project. Here, for SIM, companies mix this process with a measurement system in order to integrate into the decision making, environmental and social criteria. For example, at Recticel, “after the feasibility, after the pilot project and after the industrialization », they measure the carbon footprint of the project in order to assess the sustainability aspect throughout the whole “lifetime of a project” (interviewee n°1).

Therefore, measuring sustainability is key in all the companies, either to evaluate and rank their projects, take better decisions or to set goals and assess their progress year after year.

#### *5.2.4 Information and learning management*

During the innovation processes or when evaluating the market trends for the BMI process, there is new information that is acquired, and this learning process is also very important when managing SI. This process might represent a system for sharing information outside the company, with the ecosystem, whether it being an integrated report or a more open process to share knowledge, or a specific system for sharing the new information and learning inside the company.

Integrated reporting is a very common way for the companies we have interviewed to present their latest achievements regarding SI supported by concrete data. These are usually under the form of a “sustainability report that is integrated into a financial report” to show the company’s performance to the external stakeholders. Another way to share information and knowledge with the ecosystem of the company is throughout open innovation. There are different methods to do it. There are a few companies that only share their prototyping and applications with their suppliers, who “have more power on the market” (interviewee n°1) and “have large R&D departments” (interviewee n°6) to bring to life these innovations. That is, according to interviewee n°6, a great way “to involve and have strong relationships with suppliers”. Another method is to share these innovations with “startups, accelerators and innovators that can actually go and help” (interviewee n°4) the company with these new ideas. Finally, the last method, which according to interviewee n°1 is not easy to do as only “few applications that” they “have or had are coming from open innovations”, is actually to completely open source the technologies and make them available for the entire industry. This is very common at Levi Strauss:

But then quickly we try to bring our peers together because we believe that if you really want to imprint a change, you need to gather an industry. So, that's the step that we take. We're thinking about a technology like Waterless technology, we share it with peers, we open source it. And so, we share all the technological information so then they can use it (Interview N°6, Appendix 18).

Knowledge and transversal learning management within the company is also very important, especially for the biggest companies like Engie, AXA or Procter & Gamble, where there are many business units who have a lot of autonomy. According to interviewee n°2:

The worst thing that can happen in a big corporation is that you're working on a new idea, you put all these resources into a new idea and you realize that somebody else in the same company is working on the idea, is doing it better, and that the company is basically spending money twice on it while you could have been just working together.

To avoid this problem and maintain the autonomy of the different units, some companies have implemented a platform regarding sustainability to share the “learnings, best practices across technology, knowledge and intelligence” (interviewee n°4). Engie has also implemented a specific system called “proof of concept” (interviewee n°2) where the objective is for everyone who took part in a project, employees and clients, to share their experience and what they have learned. And that information will be shared later to “a network of people who are interested in sustainability” in order “to maximize the sharing from one side to the other” (interviewee n°2).

Managing knowledge and information is key regarding SIM, whether it being to improve the internal learning processes of project management or sharing it with the external actors to have bigger impact. However, the external relations can be more than simply based on knowledge and information.

### *5.2.5 External relations*

From stakeholder management to building new partnerships, this element is essential in SIM. Similarly, to BMI, it is very complex to isolate these relations as they can be directly involved in the core business of the company or in the knowledge management processes. However,

according to the interviewees, it is a major element today for developing long lasting innovations and also having a positive impact overall.

When the business model of the company changes to be more centred on SI, there are a lot of new external actors that appear and who need to be integrated in the process. These stakeholders might be important people on the whole value chain of the company like the customers, suppliers, local authorities or NGOs that “work on specific subjects regarding the environment, biodiversity protection or the fight against plastic pollution” (interviewee n°5). Stakeholder management can occur through two ways. First, after identifying the relevant customers and “engaging conversation with them” (interviewee n°2), companies can integrate them into the strategy building process in order “to evaluate the relevance of the company’s objectives and actions” (interviewee n°5). It is a great approach to understand their point of view, “the current trends on the market” (interviewee n°3) and develop a relevant SI program with a real impact.

The second approach is to involve them into the business strategy and collaborate with them to develop specific actions and become partners. This is the case for Levi’s who developed in its factories in Bangladesh, with the support of local authorities and organizations, a system to re-use the water for the production process in a circular way but also “make drinkable water available to the entire community living around and working at the factory” (interviewee n°6). Another example is Procter & Gamble who decided to act on the end-of-life of its products and thus the company is actually “entering into a much more complex ecosystem”, by working with a set of stakeholders like “recyclers and cities to actually close the loop” (interviewee n°4).

Finally, similarly to the previous point, some companies are also extending their partnerships, not only towards stakeholders but more generally towards other companies. These new partnerships are made in order to multiply opportunities for both companies or simply because “it is not the company’s core business but the problem behind it is too big for the company to ignore” (interviewee n°1). For example, there is AXA, who is working together with ING in order to re-design the customer experience and take into account more current issues for the customers about mobility. Then there is also Recticel who teamed up with “Eco-mobilier, an institute that organizes the take-back system of the mattresses” (interviewee n°1), and who also

created a big project called Horizon2020 with eight other European companies and innovators, to develop new technologies around chemical recycling and sustainable design. And finally, there is Levi Strauss that has many technology-related partners like Jeanologia, a Spanish company that worked with Levi's to develop a waterless laser technology, or the very famous Patagonia:

We always try to do things also with others and bring everybody together. It's quite known that in the US we are quite close with Patagonia for example. So, we often shared initiatives with them because we shared the same objectives of sustainability. For us it's really important to share things in order to evolve in a better way (Interview N°6, Appendix 18).

Managing the new relations related to new SI objectives and strategies is essential for companies in order to be relevant and have a real positive impact.

#### *5.2.6 Operationalization*

The last element that have emerged from the interviews concerns the ability to operationalize the new strategies and goals in order to transform the company's ambition into real, manageable operations. This is an essential element for SIM but also a major challenge for big companies as the objective of operationalization is to align the big corporate objectives with the day-to-day business and match the short-term with the long-term view.

Although some companies might have built a strong vision around SI, the struggle to effectively manage the transformation of this vision into daily objectives is real. According to interviewee n°2, "as much as the culture of the company is changing and is leaning towards sustainability, it is not necessarily the number one thing on everyone's agenda when they have business objectives they have to hit". So, a great objective for many of the managers we have interviewed is to align these objectives in order to avoid any disconnection that wouldn't lead to any change in the company. The employees, "at the end of the day, are building something or selling something," and if someone does not "help them understand the parts in the puzzle that they can play" (interviewee n°3), they will be lost as SI might be completely out of their role in the first place. Therefore, many companies set clear goals and targets at every level of the company which is a way to set a fix framework and also to see evolutions. Spadel has

created an “online alignment platform for the day-to-day business” where they display the corporate ambitions as well as the “objectives in which you can put the work into the day to day” (interviewee n°5), which serve the ambitions and allows employees to perform better.

And finally, managing operationalization within SI also means to support and supervise the daily business shift that needs to be made “from short-term focus towards valuing long-term strategies” (interviewee n°3). It is a common challenge that actually the companies we have interviewed still struggle to do. “Incremental innovation and short-term projects are much more valued” in companies as they are considered by many as easier to implement and is economically safer (interviewee n°5). However, the managers all agree that disruptive innovation is essential for companies to thrive in sustainability. For now, the common approach is to act among the top management and give more weight to sustainable criteria when deciding to start a new project. However, this approach is related to the strategic side and not really the operational, where still in project teams, disruptive innovation takes “more resources, time, and money” (interviewee n°5). For the moment, this also is managed through elements we mentioned above like education and corporate culture, in order to help employees to develop the “right mindset shift to apply the business shift” (interviewee n°4) in their daily jobs and be motivated to work on disruptive innovations.

### 5.3 Key managerial competences for SI

Just like for the SIM practices, there were a lot of similar individual competences that the managers we have interviewed have experienced over their career by working around sustainability and innovation. We have identified three main elements in the managerial skills and mindset that became important for SIM according to our interviewees.

#### 5.3.1 *Authentic leadership*

Managing SI in large companies who have existed for a long time without SI is a huge challenge that represents a continuous fight to convince people that SI it is not a cost but an opportunity, and also to inspire them to prioritize SI in their mindset by being personally immersed in this fight.

According to interviewee n°4, “for some reasons, the world has decided that sustainability will be a trade-off” and therefore managers have to “help alleviate the burden so that it is instead about a new opportunity of innovation”. To implement disruptive innovation and systemic changes for sustainability is a continuous battle where managers have to convince top managers that the SI projects “are going to bring business value” (interviewee n°3), be profitable and that “it is worth funding them” (interviewee n°2). Moreover, in order to make SI exciting for their teams and for the top management, they have to be inspiring. Inspire people to help them forget that SI is a cost but also to encourage productivity and creativity. Frantz Beznik, from Procter & Gamble, has defined this through his personal motto: Make Sustainable Irresistible©. This characterizes the mindset he wants to create among his team where a SI shouldn't represent a trade-off for the customer but an “amazing idea that they love”, they want to have, they need to have, and they couldn't live without it. And he uses this motto in all his project management in order to push creativity and design forward. And finally, SI managers have to be personally immersed and be a representative of this new mindset in the company. They need to have empathy and they need to understand the stakes of their function in order to transform the new objectives from numbers to a real impact.

These managers have to be the leaders of SI, by continuous convincing and inspiration. And the authenticity of this leadership comes from their immersion and implication.

### 5.3.2 *Flexibility*

As SIM is a lot about change management and transformation within companies, managers have to be flexible in their skills, jobs, in their personal mindset and have to surround themselves of a diverse and just as flexible team.

Flexibility in the career, whether it be for the skills or the jobs, is about the ability and the willingness to rotate and switch functions frequently. This allows the managers to develop a “broader view” and perspective on the business, and it is also for them “an opportunity to change” and to grow (interviewee n°1). This is also a great way to develop transversal skills like interviewee n°3 who transitioned during a part of her career from CSR to innovation in order to learn new skills and work in a different environment:

I also moved out of CSR because I wanted to branch more into the business, to understand the business constraints because it's easy to talk to the convinced, but it's harder to convince people that don't know what it is.

And finally, flexibility comes from the managers but also from the team they work with. This might come from “transversal teamwork and agile projects” (interviewee n°3) or from the selection of a “diverse group of thinkers” (interviewee n°4) around the manager. Both of these approaches allow the manager to be agile in the way of working, diversify its skills and evolve as a person.

### *5.3.3 Awareness*

Finally, a last implication for SI managers is to be aware of what's happening inside but also outside the company, in terms of projects, initiatives and innovations.

There are a lot of information going on within a big company at the corporate level but also within each department. SI managers have to be vigilant and be always informed of what's going on in the company “in order to avoid two projects working on the same idea” (interviewee n°2) but also to have a clear vision of what still needs to be done. It also might bring new ideas and inspiration, like interviewee n°2, who is frequently talking with another employee of Engie US, working on SI too, in order “share the learning” and personal knowledge each of them have acquired and experienced.

Similarly, SI managers have to be “alert and open to the external world” (interviewee n°5) and be informed of what's going on around the company. Whether it be about the “current legislations around sustainability” (interviewee n°1) or the market trends that concern the customers or the practices that other companies are doing, managers have to gather information and learn from the outside. This a great way to remain relevant and reduce the risks that might come from the novelty of SI.

## Chapter 6: Discussion

In this final chapter of our empirical research, we discuss our results in order to bring a clear answer to our research question. We begin by a summary of our findings and then we interpret the different elements we have gathered based on our findings from the literature review in order to build our model. We finally end this chapter by highlighting the theoretical and practical contributions of our model.

### 6.1 Summary of the results

Based on our research question, “How do the organizational practices and individual competences enable sustainable innovation management?”, we have divided our results in two parts: the organizational practices and the individual managerial competences.

Our results indicate that SI is managed through a set of six main organizational practices: business model innovation, cultural change management, SI performance measuring, information management and learning processes, external relations and operationalization. These practices allow companies to create relevant sustainable value, by designing innovative and sustainable strategies and business models based on information from the market and the stakeholders. The relevancy of this value is also enabled by a set of metrics that allow companies to keep track of their progress and improve the sustainable and innovative performance of their projects. SIM is also characterized by the operationalization of these strategies where the alignment of the objectives is enabled through a strong corporate culture, communication and education around sustainability, change and creativity. Finally, SIM is not only about collecting information from stakeholders, but in order to obtain greater impact, companies integrate stakeholders in the decision-making process and also collaborate with them or with other actors of the company’s ecosystem.

Regarding the individual managerial competences, based on our results, there seem to be three main traits and characteristics that SI managers need to have or develop overtime: authentic leadership, flexibility and awareness. Managing SI and delivering relevant sustainable value is a dynamic process that requires a great sense of transversal skills acquired through a flexible career and mindset. For aligning the operations to the strategy and get everyone, from employees to stakeholders, involved, SI managers need to be personally involved leaders, to

inspire and convince the more sceptical to change. Finally, awareness is a necessary trait that goes from knowing every internal process in order to detect potential future opportunities to having an open eye on the ecosystem and the market as the business value depends on it.

## 6.2 Interpretation of the results

In order to develop our model, we will interpret the dynamics and interconnections between these SIM practices and competences by confronting our empirical findings to our literature review. The six organizational practices that we have encountered seem to represent four main touchpoints that enable SIM through four different ways. These touchpoints follow a similar structure to the classification made by Adams et al. (2016), about the three main SI processes (Appendix 1), as well as to the three perspectives of SI from Cillo et al. (2019): they go from a very corporate, internal level to end up at an external level, the ecosystem.

A first touchpoint is the *development of the strategy and the design process*, that enable the company to create and capture a relevant and solid business value. Similarly to Evans et al. (2017), the sustainable value creation process through BMI is a central element, as it enables the organization to adapt and re-think the whole business model from the start. The design of the new business and strategy can be made through a sustainable DT process, where the sustainability considerations are integrated all along the original DT process, as introduced by Shapira et al. (2017). However, this touchpoint is not only about the design but also about the development of a solid SI strategy and its integration into the global strategy, a key element as stated by Roome and Louche (2016).

From the standpoint of the SI manager, this touchpoint requires a lot of flexibility to enable the dynamic aspect of SIM. To create relevant value, the organizational practices need to evolve with the market and SI managers need to be agile enough in their skills and mindset to innovate quickly. SI managers also need to be aware of what's happening on the market in order to develop the most relevant innovations and processes. Moreover, as developed by Wesselink et al. (2015), foresighted thinking and interdisciplinarity are also necessary for this touchpoint. When designing business models, managers need to be able to detect possible opportunities and balance easily between long- and short-term perspective. Interdisciplinarity is also important as developing strategies requires to recognise other viewpoints as legitimate and facilitate the exchange of ideas across different teams and disciplines.

The second touchpoint is the *alignment of the operations to the strategy*, where the objective is to enable coordination across the whole organization through a cultural transformation in order to deliver the sustainable business value. This resembles to the organizational transformation level of SI that was defined by Adams et al. (2016), as SIM is not only about a strategy. In order to really implement sustainable innovations, the company needs to implement a cultural shift by having a strong vision and communication around SI in order to make it everyone's priority. This can also be achieved through education, training or providing a safe environment in the company for creativity, innovation and even failure, as suggested by Tidd and Bessant (2018). Coordination is achieved through communication but also through the development of clear and manageable day-to-day objectives or alignment platforms that can show every employee's role in the bigger SI strategy. According to our results, managing this transformation and the coordination represents the biggest challenge for companies regarding SI and that matches with our findings in literature about the SI barriers stated by Clark and Charter (2007).

From the individual standpoint, authentic leadership is the key competence to have as, whether it be from the operational or the educational side, SI managers need to be the fore-front persons that inspire and motivate those who need to adapt. To be even more convincing as they convey the company's vision, authenticity through personal involvement is very important. In addition to this characteristic, SI managers should also develop their strategic management competence. This represents organizational planning skills from arranging tasks to managing people and resources (Wesselink et al., 2015).

Third touchpoint is *the evaluation of the operations and projects* that enables organizations to assess their performance and progress on SI, track how they deliver the value and improve or adapt their strategy. Through a set of metrics based on relevant KPIs, companies can measure SI but also frame their project management and add new considerations into the decision-making process. This can be a type of index based on the TBL framework that measures sustainable business performance (Schaltegger et al., 2016) or a type of project management that integrates sustainability into the innovation lifecycle. This is a very similar concept to the performance evaluation of Cillo et al. (2019) where the SI outcomes are measured. This assessment is usually communicated through a report to show the company's progress regarding its objectives.

Even though this touchpoint appears to be mainly organizational as the measurement and tracking are based on rigid frameworks, SI managers can intervene by identifying the relevant KPIs but also by taking the strategic decisions based on this assessment. These activities are two elements related to the strategic management competence, according to Wesselink et al. (2015). Indeed, SI managers need to have a strong sense of the strategic perspective in order to design the metrics but also to find ways to improve their performance.

Finally, as SIM implies that no company exists on its own, the fourth touchpoint concerns the *integration and involvement of the company's ecosystem* and external stakeholders into the business. Very similarly to CSI (Dionisio & de Vargas, 2020), this will enable companies to create shared value and to increase the positive impact of the SI strategy. The organizational practices related to this touchpoint can go from identifying the relevant stakeholders and integrating them in the organization's business model, to co-creating sustainable innovations and re-designing entire supply chain processes with them. This is the outside-in open innovation as defined by Chesbrough (2011) (cited in Altenburger, 2018). Another practice is open innovation inside-out or when a company is open sourcing its innovations such as technologies and practices, in order to encourage a systematic and radical change within the company's ecosystem. This touchpoint is very similar to what Adams et al. (2016) has called systems building or when organizations are innovating with external partners to do good.

Regarding the SI managers, they need to be aware of what's happening in the company's ecosystem in order to detect and involve every relevant stakeholder. Moreover, they need to be authentic leaders as well, because some stakeholders, like suppliers, might not be willing to take part in a more sustainable process and managers might have to convince and motivate them. Finally, systems thinking competence can also be valuable for this touchpoint (Wesselink et al., 2015). As companies are part of a whole, SI managers have to understand the interconnections and sub-systems that drive the ecosystem in order to better understand the position and motives of their stakeholders. That will enable more relevant and effective partnerships and co-creative processes.

The following table, which is the first part of our model, presents the managerial interconnections leading to SI. It explains how, through four different touchpoints, going from the company's internal levels to the external ones, SI is managed. Each touchpoint has an

outcome related to SI and a set of organizational practices and individual managerial competences.

*Table 1: SI from the organizational and individual managerial perspective*

<b>Touchpoints</b>	<b>Outcome</b>	<b>Organizational practices</b>	<b>Individual competences</b>
<b>DESIGN</b> <i>Strategy</i>	Relevant sustainable value proposition & creation	<ul style="list-style-type: none"> <li>▪ Business Model Innovation</li> <li>▪ Sustainable DT</li> <li>▪ Setting SI goals</li> <li>▪ Embedding SI into global strategy</li> </ul>	<ul style="list-style-type: none"> <li>▪ Flexibility</li> <li>▪ Awareness</li> <li>▪ Interdisciplinarity</li> <li>▪ Foresighted thinking</li> </ul>
<b>ALIGN</b> <i>Operations</i>	Coordination & mindset shift	<ul style="list-style-type: none"> <li>▪ Alignment platforms</li> <li>▪ Vision, education and communication</li> <li>▪ Developing day-to-day objectives</li> </ul>	<ul style="list-style-type: none"> <li>▪ Authentic leadership</li> <li>▪ Strategic management</li> </ul>
<b>ASSESS</b> <i>Evaluation</i>	Real SI performance & progress	<ul style="list-style-type: none"> <li>▪ Developing metrics based on KPIs</li> <li>▪ Reporting</li> </ul>	<ul style="list-style-type: none"> <li>▪ Strategic management</li> </ul>
<b>INVOLVE</b> <i>Ecosystem</i>	Shared value & bigger positive impact	<ul style="list-style-type: none"> <li>▪ Co-creating with new partners</li> <li>▪ Stakeholder management</li> <li>▪ Open innovation inside-out</li> </ul>	<ul style="list-style-type: none"> <li>▪ Awareness</li> <li>▪ Systems thinking</li> <li>▪ Authentic leadership</li> </ul>

However, in addition to these practices and competences for each touchpoint, there is a set of information flows and learning processes happening all along every touchpoint that enable companies to learn and develop absorptive capacity. Between all the touchpoints, companies

need to manage the knowledge they have acquired or information that they have gathered. The design of a strategy needs to be based on data coming from the stakeholders or the market and it needs to be adapted for improvement based on the data coming from the performance measuring or from the operations. Companies can also share internal information in order to create a greater societal impact. The continuous flow of information in a large company requires the development of a process to share between departments knowledge learned from experiences. Moreover, absorptive capacity is the ability for companies to detect quickly the value of new knowledge and transform it into a commercialize product or process (Levinthal, 1990, cited in Adams et al., 2006). This can give real competitive advantage and is a key element of SIM that helps companies to understand the current challenges and identify profitable and innovative solutions to environmental problems (Mousavi et al., 2018).

Another aspect that we couldn't fit in our table was the legal and political context that surrounds the company and its ecosystem. Indeed, this context is represented by the policies and legislations that define the ecosystem. As explained by Clark and Charter (2007), this can be a driver for SIM but also a major barrier as SI needs strong, coherent, flexible and future-oriented environmental policies coming from the big institutions above that can set proper standards and frameworks for companies. According to our results, companies and managers need to be aware of these legislations because they shape and catalyze the SI strategies.

Therefore, the second part of our model (see below), illustrates the dynamics between the SIM touchpoints we have discussed previously, as well as these two new elements. The center of the model is the design touchpoint, that needs to capture sustainable business value, but it mainly needs to *evolve* and *adapt* (1) based on new information that comes from inside or outside the company, so that the business value remains relevant. The second touchpoint needs to align the previously designed strategies with the operations and there, SIM needs to *expand* (2) the objectives through communication and a cultural transformation. The third touchpoint concerns the assessment of the SI performance of the company's projects and operations which leads the management to *report* this assessment and *take strategic decisions* (3) based on the results. Finally, the last touchpoint is to involve the ecosystem into the business value creation in order to increase the societal outcome of the innovations, where SIM needs to *create strong partnerships* that benefit both sides (4). Concerning the absorptive capacity, companies can nourish it through all touchpoints as information can circulate from design to any other

touchpoint outwards, and vice versa. New knowledge can come directly from operations, or the results of the evaluation or the stakeholders, and create a change within the SI strategy.

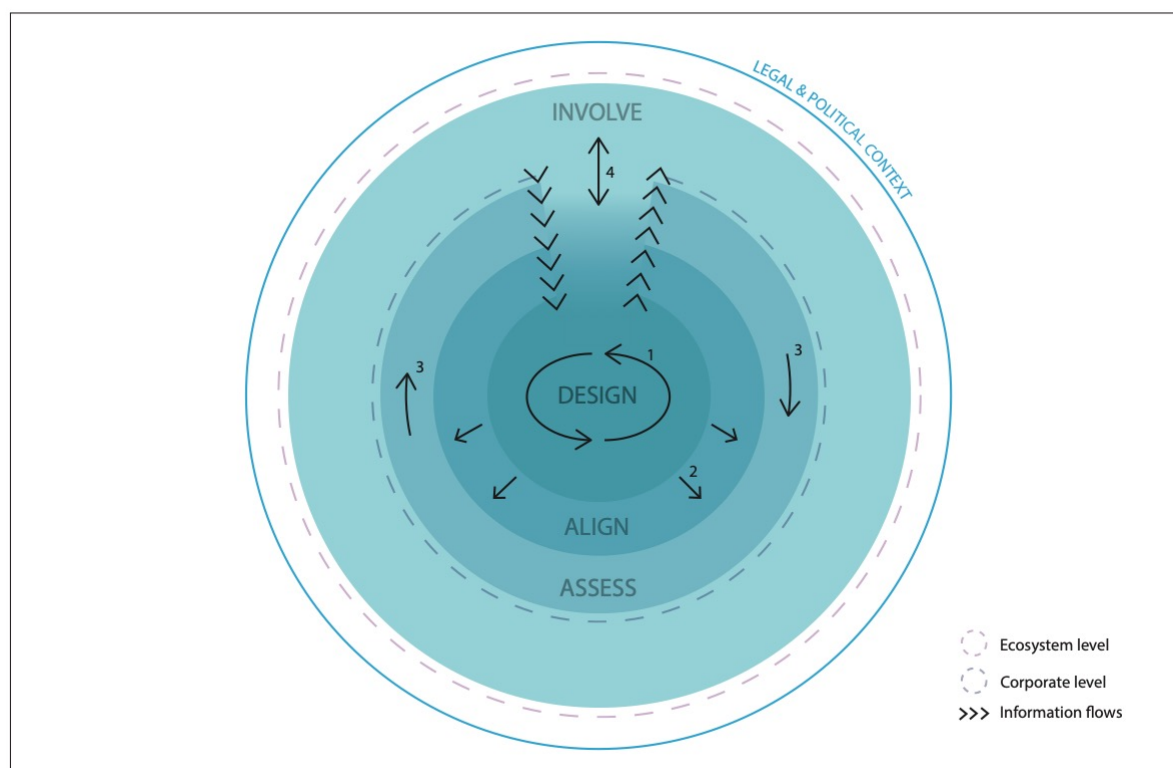


Figure 5: The dynamics of the SIM touchpoints

### 6.3 Contributions

Despite the growing literature, over the last decade, around the importance of developing innovation in order to face sustainability challenges and incite a profound organizational transformation (Adams et al., 2016), we observed a lack of papers on identifying the managerial practices and competences for managing SI, and the interconnections between them. This has been done for IM and CSM by various authors (Adams et al., 2006; Igartua et al., 2010; Lenssen & Smith, 2019) but regarding SIM very few have done it (Cillo et al., 2019).

The first theoretical contribution of this two-part model is that not only we have identified four touchpoints of action for SIM, we have linked them to a specific outcome and a set of organizational practices and individual competences. We have come across authors who either presented organizational practices for SIM (Inigo & Albareda, 2019; Cillo et al., 2019) or listed the individual competences (Wesselink et al., 2015), but none of them defined the interactions between these. And considering already existing characteristics of SI, like sustainable value,

mindset or shared value, as outcomes of SIM is also a new element. Therefore, we are providing a new perspective for the literature, on linking the SIM outcomes to organizational implications but also to individual skills, as the SI managers are usually those who represent physically SI and who are much more involved with the operational side of the business.

The second theoretical contribution is the three individual managerial competences, that have common elements with some existing skills developed by authors but also new ones. Authentic leadership could be described as the combination of three skills we have discussed in the second chapter of our literature review: strategic leadership (Riel, 2011), action and interpersonal competence (Wesselink et al., 2015). However, authentic leadership also requires managers of continuous convincing regarding the cost generated by SI. Flexibility shares many common elements with the diversity embracing and interdisciplinarity competence (Wesselink et al., 2015), although the latter did not mention the importance of job rotations, career management and personal mindset flexibility. Finally, awareness has similar elements with the systems thinking, which allows manager to better understand issues and the external environment of the company (Lenssen & Smith, 2019). However, awareness is not only about understanding but also about being conscious of what's happening outside but also inside the company.

The final theoretical contribution concerns our holistic approach for studying the dynamics of SIM, as many existing models have approached SIM only through the lens of specific theories like the DC theory (Inigo & Albareda, 2019) or the DT process (Shapira et al., 2017). Although we have also integrated the absorptive capacity theory to explain the outcome of information and knowledge management (Levinthal, 1990, cited in Adams et al., 2006), we consider SIM as a process involving all levels of a company and effecting all departments.

Regarding the managerial and practical side of our contributions, our model aims to help and guide companies to implement SI strategies by having in mind all the interconnections that might occur from SIM. Two barriers to the implementation of SI are the conceptual obstacles and a lack of understanding of the bigger system and of the relations with stakeholders (Clark & Charter, 2007). We want to alleviate these issues by first providing a holistic model that helps visualize and understand the concept of SIM with clear practices and outcomes. Second, we also highlighted the dynamics of SIM in order to explain the interconnections between all elements of the SIM as a systemic process.

A second practical contribution of this model is that we have provided touchpoints and a set of managerial practices and skills to elements that our interviewees considered as very challenging in the practical world of SIM. The organizational flexibility, the operationalization of the strategies and the cultural transformation were considered as current top priorities by SI managers, especially for large organizations where change, coordination and communication are already tricky processes. Our model aims to deconstruct these challenges in smaller set of actions that can help companies to think of solutions that they did not consider before.

This model can also guide top managers in their strategic decision-making process, regarding the transformation of the organization towards sustainability and innovation. SI strategies need to be based on this process and the decisions from the top management should be made with this SIM process in mind. As we have linked outcomes to clear managerial touchpoints, operational strategies can include those outcomes as their SI goals or even their KPIs to evaluate the performance of each step of the SIM process. Therefore, managers can detect problems in not efficient SI strategies and switch the priorities towards touchpoints that need more attention.

Finally, by linking the individual competences to organizational practices, our model aims to help SI managers to understand the managerial skills that they can mobilize when confronted to some bigger organizational challenges. As we have seen in the literature, their role shouldn't be neglected as they represent the SI strategies and the company's vision on those concerns (Riel, 2011). Therefore, our model provides a set of skills for every touchpoint of the whole process of SIM.

## CONCLUSION

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### 1. Research summary

The aim of this thesis was to clarify the concept of SIM as a large systemic process by explaining the dynamics and interconnections occurring in this process. Based on a qualitative research where we interviewed SI managers of six large companies, all from different industries, we analysed the data and provided a first set of answers to our research question: “How do the organizational practices and individual competences enable sustainable innovation management?”.

By confronting the results to our literature review, we developed a two-part model that explains the four touchpoints of action for SIM (design, align, assess and involve) as well as the dynamics between these four touchpoints at a corporate, individual and ecosystem-based level. These four managerial touchpoints enable SIM by: (1) the creation and capture of relevant and flexible sustainable business value; (2) the coordination of the operations and a cultural transformation allowing the whole organization to deliver that value; (3) the evaluation of the SI performance and progress in order to track the delivering process of the value; and (4) the creation of shared value and the increase of societal outcomes within the ecosystem.

Our model also brings answers and clarification regarding obstacles and challenges that have been highlighted in the past by authors or top SI managers. Even though we considered SIM through a holistic approach, the objective of this model is not to determine a general truth, but rather to bring a new light on elements and links that weren't discussed before and guide managers on what practices and skills they might need to focus on more to obtain specific outcomes. Therefore, they should consider our model as a first step for the implementation or as an additional help for the management of their SI processes.

### 2. Managerial recommendations

For the first touchpoint, we have observed in our interviews that the focus is put on the individual flexibility and agile team working in order to create organizational flexibility. However, literature has proven that organizational flexibility requires a real framework and process to ensure that the strategy development remains dynamic and that at a corporate level,

the company can adapt and change quickly (Inigo & Albareda, 2019). Therefore, our first recommendation would be to implement a clear process to ensure flexibility at a corporate level and enable top managers to innovate in a disruptive way, not just by small and incremental product innovation.

Regarding the operational touchpoint, many managers emphasized only on the organizational practices, in order to communicate and coordinate from the top to lower levels of the organization. However, our model follows the ideas of Wesselink et al. (2015) and Adams et al. (2016) where coordination and education needs to be managed at smaller levels and SI managers have a direct and important role to be the educators and coordinators of SI. Therefore, we recommend companies to implement educational practices on smaller scales and help their managers to develop the specific skills.

The third touchpoint appears to mainly be used for measuring and reporting the performance of specific projects or operations. However, based on the fact that SI is not only achieved through projects but also through integrated SI strategies as well as the relations with stakeholders, an index to measure and analyse these outcomes could also be developed to help the company to improve its SIM process through all touchpoints.

The fourth touchpoint seems to consist as of right now, of a one-way relation, going mainly from outside to inside of the company. However, open innovation from inside-out is a very rewarding and impactful practice that seems to be left behind. Our recommendation for companies would be to develop a specific process for sharing internal information only with the most relevant external stakeholders that would become partners by producing these innovations. That lead to important benefits presented by Martovoy (2014) like cost reduction, reduced time-to-market as well as enhanced credibility (cited in Altenburger, 2018).

Another important element is the management of knowledge and new information that sometimes seems to be put aside for companies, or only be managed through reporting. According to our model, information is not only allowing companies to be aware of everything that's going on inside and outside the organization, it is the best way to update and improve the business model. Therefore, although the majority of the companies we have interviewed were lacking these, we would recommend developing a clear system for sharing new

knowledge or a process to monitor the information flows in order to keep the SIM process dynamic.

Finally, we would recommend SI managers to be pro-active regarding their competences. All of the managerial skills that we have emphasized as important can be learned and developed if the managers can quickly detect how they can use these skills for the bigger corporate challenges. This pro-activeness can also be supported by the company at higher level through training, job rotations or career management.

### **3. Limitations**

In all research paper, it is important to acknowledge the limitations that may have an impact on the results. Since this work is no exception, we have identified some limitations that are useful to consider in order to have an informed view of the various interpretations we presented.

First, as we have limited the interviews to six, due to a certain level of saturation and very selective criteria, our sample might not be truly representative of the market and the generality of our model should be considered accordingly. However, we at least took care of having companies from different sectors with both B2B and B2C businesses, as we have limited our sample to only large companies.

Second, we tried our best to provide the same framework for all the interviews while also leaving freedom to the interviewees to express their point of view. Yet, to investigate further, we sometimes asked closed questions, or questions that derived from the original framework and we also adapted the questionnaire based on remarks from the interviewees made before the interviews throughout the data collection process.

Third, the analysis of our data was made essentially on interpretations that have been influenced by the literature review we have done previously. And although we tried to interpret data as objectively as possible, it is important to acknowledge the possible existence of the interpretative and personal bias.

Fourth, due to the holistic approach of our model, we have decided to not take into account some differences between the companies that we have interviewed, like the production or distribution processes, or even the way they were considering SI in their organization structure.

This can raise questions about the accuracy of a holistic management model as companies differ in many ways from each other.

Finally, as conscientiously as this thesis has been conducted, our analysis may lack practical and pragmatic SIM insights as we are only students with little professional experience. Consequently, our understanding of the complex structure and management of large companies is limited, and we realize that a more prolonged exposure in innovative and sustainability-oriented companies would have allowed a greater perspective and a deeper understanding of the complex and challenging topic of SI.

#### **4. Suggestions for future research**

Our model could be the starting point for many future researches as SIM is a quite new concept and although we have brought more clarity to the holistic approach of it, there are other ways this holistic approach could be studied and thus enrich the literature on SIM.

To deepen the understanding of SIM or to give more practical recommendations to companies and managers, a first approach would be to monitor these SIM touchpoints quantitatively over time and provide a framework with a timeline and the different steps to follow for companies who would like to implement and manage SI from the start.

A second approach could be to integrate more specific elements, that we have decided to keep apart, like the distribution and production process, and narrow the research down to a certain sector in order to still find common elements within the sample while developing more detailed and specific management models for SI.

In addition, we interviewed companies from different sectors and found that SI was applicable to all of them, so a third approach could be to compare SIM within different sectors and maybe even develop it for companies in less industrialised countries. Similarly, one of our criteria was regarding the size of companies. Therefore, we could imagine another approach that could develop a management model for SIM within smaller organization or start-ups.

Finally, we have decided in our theoretical part to only consider disruptive innovation as it is the most effective for transformational change and thus the most challenging. However, it might be possible that the SIM practices and processes are different for incremental innovations

therefore it could be interesting to see what literature can teach us about this and develop a model regarding those practices.

Regarding future research that would enlarge the literature around SIM, a first lead could be to study the relationship between the SIM outcomes, practices and competences with regard to firm performance. Thus, relations and dynamics could be found regarding the financial, social and environmental effectiveness and performance of SIM.

Furthermore, our model acknowledges the legal and political boundaries to SI which are considered as a main challenge by our interviewees and CEOs (United Nations Global Compact & Accenture Strategy, 2019). However, the managerial implications of those boundaries are not really studied in the literature. Therefore, it would be interesting to identify managerial practices and competences that would enable companies to better integrate those boundaries or to influence governments and politics for better regulations and frameworks around SI.

Another lead for further research could look at the seemingly complicated relationship between open innovation and SIM practices. Indeed, our results showed that some companies managing SI found open innovation a myth while others a necessary step. Therefore, it would be interesting to develop the incentives of that relationship and find managerial practices and organizational processes to improve it.

Finally, a new stream of literature will also probably rise from the Covid19 situation as between the TBL framework, there seem to be a new threat regarding the economical aspect of business. This new threat would probably impact the SIM process as well and could lead to new research to help companies with the prioritization situation and bring answer to the question: How companies can keep delivering sustainable and innovative value amidst a social and economic crisis?

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