**Defining a Sustainably-Driven Business Modeling Strategy with a ‘Storytelling Science’ Approach**

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**Abstract**

This chapter will provide a general conceptual overview of a sustainability-driven business modeling (SBM) strategy from a "storytelling science" perspective. Storytelling science uses C.S. Peirce’s abduction-induction-deduction (AID) approach in a self-correcting series of cycles in order to get closer to what is true for the ecology as a whole, and what regimes of truth can be deconstructed for particular stakeholders (business, government, people, living systems of nature). Our purpose is to demonstrate how storytelling science can be helpful in exploring differences between sustainability strategies and their connections to some other aspect of business modelling, so that the SBM approach can be better understood, implemented and communicated. We examine several examples to illuminate multiple dimensions of SBM strategies that stand to benefit from the use of storytelling science. Discussing on the overview of "storytelling science" and SBM strategy, we organize our conceptual understanding into three sections: (i) how SBM and storytelling in socially responsible capitalism can help understand what is socially and ecologically sustainable, rather than only what is profitable to particular stakeholders; (ii) how are the methodological and philosophical perspectives; and (iii) what are the drivers, enablers, and barriers in the implementation of an SBM strategy. The benefit of ecologically and socially-sustainability-driven business models is they can utilize the storytelling method of AID cycles to find ways of business value creation that do not exceed planetary carrying capacities. Finally, we describe potential ways of implementing storytelling science in strategy, marketing, management, international business and global value chain studies focusing sustainability.

**Keywords:** sustainability, business modeling, strategy, Abduction-Induction-Deduction cycles, storytelling science, socially-responsible-capitalism

**Introduction**

Recently, business modeling has taken a turn toward an emphasis on ecological sustainability (Bocken, Boons, & Baldassarre, 2019; Boons & Laasch, 2019; Dentchev et al. 2018; Hahn et al., 2014; Joyce & Paquin, 2016; Lüdeke-Freund et al, 2019; Lüdeke-Freund et al., 2019; Nielsen et al., 2018; Vladimirova, 2019). There is a similar sustainability-driven turn toward the development of a storytelling science methodology in business storytelling (See, Boje, 2019a, 2019b, 2019c; Boje & Rosile, 2019; Boje, Rosile & Claw, 2018). This chapter seeks to combine these two trends. While the ecological sustainability-driven turn tends to focus on ecological and environmental issues in business modeling from efficiency and financial logic perspectives, the sustainability-driven turn in business storytelling presents more detailed stories, explanations, arguments, and contextual concerns through a wider range of frames of logic. Both turns can potentially be grounded in a terrestrial ethics (Mølbjerg Jorgensen, Svane, and Boje, *in review*) approach to business modeling. The ecological and sustainability turns in business modeling can benefit from a terrestrial ethics foundation because it brings into question the premise of infinite economic growth and the assumptions of "sustainable [economic] development" modeling that fail to take account of the planet’s finite natural resources. Put simply, a terrestrial ethics approach offers a whole systems view toward limiting economic growth in accordance with Earth’s finite resource capacities, and not exhausting these capacities faster than natural systems can renew them. Thus, the combination of storytelling and the ecological turns will help future researchers to present the reality of terrestrial capacities from multiple perspectives and logics, covering both people’s subjective perspectives (i.e. diverse cultural contexts and individual interests) and multi-contextual phenomena through the application of what Foucault (2011) calls "regimes of truth". Truth regimes include the reactions and logics of heterogeneous actors, the strategies and logics of firms, and discourses on ethics, which in turn focus on optimum use, allocation, and exploitation of resources and care and protection of the planet. Each business model has stories and discourses it accepts as true and distinguishes these from those it frames as false. Business model also offers strategies, techniques and procedures to create or grant value added in a value chain and supply chain. At issue in this chapter is how to include various discussion on sustainability and storytelling that distinguish true and false in different ways, and to identify the storytelling techniques that can be helpful to business modelers. A terrestrial capacities approach has the potential to change the way business modelers look at many aspects of doing business, including product development, production, marketing, supply changes, value chain management, and social responsibility. In this chapter, we propose a business storytelling approach to business modeling strategizing, and explain its relevance to sustainability-driven business modeling.

In particular, we explain *how does sustainability-driven business modeling (SBM) strategy benefit from storytelling science, and how do we understand the particular SBM that can be useful for future researchers to combine methods of storytelling science with SBM?*

Our approach is based on a self-correcting iterative "storytelling science" paradigm that includes iterative processes of phase-by-phase testing of assumptions and propositions. For example, self-correcting involves adjusting the theory using the perspectives of multiple actors, as examined through interviews and case studies. It is expected that some of this data will confirm elements of the theory, while others will disconfirm it; disconfirmations are taken into account and the theory and propositions corrected and the story re-narrated rather than using a method such as snowball sampling that confirms initial theorizing. Each round of self-correcting tests (interviews, experiments, cases, etc.) reveals new information that enables increasing confidence in a truth that fits with the reality of the audience of confirmers and disconfirmers (Boje & Rosile, 2020).

In the following section, we discuss conceptual, methodological, and philosophical positioning that can help researchers to explain the benefits of a storytelling approach for the illustration of complex realities in sustainability-driven business modeling.

***The Contributions of Storytelling Science***

Storytelling is defined as the combination and interplay of diverse narratives, living stories, and their antenarrative relationships, communicated in a convincing manner (Boje, 2001, 2008a, 20011). *"Antenarrative"* relationships are defined as antecedent to narratives and stories, including the not yet told, and interacting in moving-fragments that are already-constituted in narratives and stories in a social setting. Antenarratives theory was initially concerned primarily with *before* narratives, and various *bets* on the future possibilities of world-making strategies (Boje, 2001, 2008a, 2011). The theory later gained additional concepts that interconnected the *before* and *bets* elements with conceptualizations of the *beneath*, *between*, *becoming*, and *beyond*. Stories are frequently challenged, reinterpreted, and revised by listeners as they unfold in conversation, and thus they are dynamic and constructed socially and contextually. We therefore need to carefully link it with narratives and antenarratives considering multiple facets of it.While a full review is beyond the scope of this paper, we can offer an introduction to relevant antenarrative concepts and how they can potentially contribute to business modeling:

* *Beneath* refers to the fore conceptions, the thoughts and ideas about sustainability, such as the presumption of unlimited economic growth that often underlies ideas of sustainable development, in contrast to sustainability modeling that presumes limits to growth.
* *Before* is the history of modeling of extraction approaches, both with and without consideration of terrestrial capacities.
* *Between* concerns infrastructures, such as how organizations are embedded in supply, productions, and management chains, which, as COVID-19 has demonstrated, are easily disrupted by a lingering pandemic.
* *Bets on the future* are strategic forecasts about how the future will unfold. In business modeling, these relate to differing temporal horizons of when Earth’s capacities will renew or when rising sea levels will unleash a cascade of other tipping points (e.g., coral reefs, once bleached, do not return; ocean currents that change may take centuries to stabilize).
* *Becoming* involves what is ethical, considering what kinds of ethics are becoming more entrenched. We focus on two ethics presented by Bakhtin (1993): the bystander ethics of looking on and not intervening in unsustainable practices, and the moral answerability of reflecting on one’s own obligation to act with whatever skills and resources are available.
* *Beyond* is a foregrasping which can be described as what is beyond the senses, a way of knowing that Charles Sanders Peirce calls abduction, those flashes of intuition that need inquiry and some inductive testing, so the deducing of modeling is not, as the nursery rhyme says, built on a house of straw.

A "storytelling science" approach (Boje & Rosile, 2*020*) also attempts to move beyond the duality of quantitative versus qualitative approaches. Our approach to storytelling science is rooted in Charles Sanders Peirce’s (1933-1937) semiotics of “abduction-induction-deduction”, which we apply here to both business storytelling and business modeling strategy. According to Peirce, abduction (or hypothetic inference) begins with intelligent guesswork and intuition about how a phenomenon will present itself. Induction investigates experiences in order to confirm or refute abductive hypotheses. Deduction depends on the theorizing ability to analyze meanings of semiotic signs by deducting the less/ no possibilities. Karl Popper (2008) has his own way of responding to induction, through a process he calls “trial-and-error” problem solving. Despite the difference in approach, both Peirce and Popper are concerned that without doing disconfirmation tests of one’s own theories, assumptions, and adductions, one only is doing confirmation inquiry, which in turn means that the induction fallacy continues to be a problem for research. To refute or falsify one’s own work is part of a self-correcting method. This involves using qualitative and quantitative methods and not treating them as *either-or*, but rather as *both-and* approaches in the process of self-correction.

We can combine quantitative induction tests with qualitative induction tests. For example, a qualimetrics approach (based on Peirce’s AID triad) includes quantitative financial data, quantitative data on business processes such as frequencies of a given challenge or problem, and qualitative interviews and ethnographic field notes (Bonnet, Savall A., Savall H., & Zardet, 2018). There is an important grounding in terrestrial ethics, which has significant implications for business modeling. A social and ecological shift in capitalism itself integrates the use of qualimetrics (the integration of financial and quantitative indicators along with qualitative field case studies) with an ecological understanding of limited planetary capacities (Savall, Peron, Zardet, & Bonnet, 2018). Since different natural resource contexts and institutional arrangements shape and manifest capitalism differently (Rana 2014). This in turn informs decision-making processes and logics for firms in business modeling strategies (Rana and Nipa, 2018), and business storytelling science can help investigate and explain sustainability-driven business modeling in a comprehensive manner by taking into account the dynamics and diversity of capitalism and social systems around the world that have planetary capacity limits to growth. In sum, this approach recognizes that business storytelling is situated not only in socioeconomic practices, but also within planetary limits and multiple perspectives.

***Integration of Storytelling Science with Sustainability-Driven Business Modeling***

It is time for business modeling, with its value proposition, global value chain management, etc.to no longer exceed twelve critical planetary limits that are moving business practices and societies from safe risk to increasing risk, and high risk crises (Ripple et al., 2017):

1. Climate change (increasing risk)
2. Novel entities (unknown risk, as yet un-quantified)
3. Stratospheric ozone depletion (low risk, for now, but unknown risk in the long term)
4. Atmospheric ozone loading (not yet quantified risk)
5. Ocean acidification (low risk, moving to increasing risk)
6. Biogeochemical Flows (high risk)
7. Fresh water (low risk, moving to increasing risk)
8. Land system change (increasing risk)
9. Biosphere integrity (high risk)
10. Social inequality (risk of discrimination, inequality of wealth and living conditions)
11. Workplace and customer health, safety, and satisfaction (risk to employees and consumers rights, safety, and happiness)
12. Human rights, deprivation, equality, and justice (risk to social order and justice)

Business modeling is beginning to develop its value proposition logic to include ecology and society, and has the potential to address planetary limits such as these. There is now a need for a transdisciplinary approach which integrates a business modeling strategy and a business storytelling science that are both responsive and "morally answerable" (Bakhtin, 1993: 3) to planetary limits.

This chapter is organized around the following questions: i) how is SBM linked to storytelling science in ecologically and socially responsible capitalism?, ii) how are the methodological and philosophical perspectives of storytelling science linked with SBM?; and iii) how do drivers, enablers, and barriers influence the development and implementation of SBM? This conceptual understanding will form the basis for specific cases and anecdotes to illuminate future studies with a storytelling perspective in strategizing SBM.

**Conceptual Understanding:**

1. ***SBM and Storytelling of Ecologically and Socially Responsible Capitalism:***

*SMB and Storytelling:*

Savall, Péron*,* Zardet, and Bonnet (2017) provide an approach to the development of a socially responsible capitalism that is also ecologically responsible. Savall (2018) develops ways to respond to socioeconomic crises following the Spanish economist German Bernácer. Boje has worked with Savall and other colleagues in France for over twenty years to integrate storytelling science into their socioeconomic approach. For example, so-called "researcher-intervenors" collect stories from interviews, meetings, and documents in order to analyze how specific situations have developed, and better understand the reality in relation to the research question. Project teams then work on resolving problems using the Abduction-Induction-Deduction (AID) approach. Abduction searches for theories, deduction seeks predictions, and induction searches for facts. If the facts prove elusive, the process restarts from the beginning, following deduction, and repeating itself until the facts that “fit” are found, and leading to the process of abduction. Induction, deduction, and abduction are forms of logical reasoning that are used in every type of research (both qualitative and quantitative). Alongside observation, they create the basis of all research. Therefore, these forms of thinking are not concepts or methods or tools of data analysis; rather, they are the means of connecting and generating ideas and developing reasoning for research process.

The "socio-economic approach to management" (SEAM) developed by Henri Savall and colleagues stresses investigation through the Peircean "AID" approach and through the "qualimetrics" triadic of qualitative-quantitative-financial in order to establish a moral ontology of socially responsible capitalism. Given the focus on combining qualitative, quantitative, and financial together with a scientific SEAM intervention, there is compatibility here with storytelling science. Both focus on AID, and SEAM also emphasizes the scientific method in storytelling science, this comes through in the self-correcting phases of projects.

By "storytelling science", then, we mean ways of iteratively documenting abductive first guesses (flashes of intuition), by doing inductive tests (both qualitative and quantitative inquiries) and adjusting deduced theories in a process of ongoing self-correction. This process gradually brings us closer to the truth, and highlights the need to model and test all relevant competing regimes of truth.

Thus we have suggested that SBM can benefit from a storytelling science of self-correction by incorporating qualimetric (i.e., financial, quantitative, and qualitative field cases) in longitudinal research designs. We have stressed that such an approach is not concerned solely with confirming theories, but also involves actively attempting to include qualimetrics to disprove theories and/or challenge assumptions in order to come up with a more valid and reliable explanation.

*Next, we discuss how SBM and the Storytelling of Ecologically and Socially Responsible Capitalism connect, and how they can be applied in tandem to business modeling and communication.*

*Application of SBM in a Storytelling Science paradigm:*

In this section, we apply our integrated storytelling science approach to the deployment of sustainability-driven business modeling and apply it to practical cases. The benefit of ecological and social sustainability-driven models is that they can utilize the storytelling method of AID cycles to find ways of doing business that do not exceed planetary carrying capacities.

We suggest that storytelling science has an important contribution to make toward business modeling by diagnosing the regimes of truths, documenting the various abductions, and engaging in inductive tests to generate deductive theories that deconstruct the fake or the fantasy from what might remain as the truth (Larsen, Boje, & Bruun, 2020; Boje & Rosile, 2020).

At a more general level, storytelling science helps researchers to follow and organise the research process in a way that can combine multiple ontological lenses (i.e. following AID). However, storytelling can also help researchers to deconstruct or explain the complexity of a phenomenon by combining multiple perspectives, dynamics, dimensions, details, and contexts from micro to macro levels of ecologically and socially responsible capitalism by following triadic of Peircean “AID” and “qualimetrics” to make reality concrete, sense-making and useful for strategy formulation.

For example, research on customer satisfaction with a consumer electronics product follows a relatively linear process concerned with the understanding of consumers’ social, cultural, financial, and technological backgrounds and expectations. However, a study on shop floor workers’ satisfaction with supplier factories involves the dynamics of multiple actors, organizational practices, and incentive structures, and is even more complex when the supplier is located in a different institutional context and linked with a global value chain in which foreign buyers from Western countries determine requirements and conditions for production. In such a case, storytelling science can help accurately assess and communicate the reality of the situation, and move SBM to the next level of analysis, seeking the truth and constructing the reality.

A business model works at the organizational and functional levels by describing the logic of how an organization creates, delivers, and captures value. This takes into consideration economic, social, and environmental rationales, concerns, and priorities (Amit & Zott, 2001). A sustainability-driven business model is specifically intended to be an innovative part of a business strategy that considers all stakeholder expectations and the future survival of humanity and the planet. Storytelling science has an important role to play in the process of socially constructing the meaning of sustainability-driven business modeling at the corporate and functional strategy level, taking into account these macro-level dynamics.

In general, a business model explains how a firm's activities work together to develop strategies and bridge strategy and implementation. It also reflects how the firm targets customers and positions its products by creating value throughout its activities – in other words, it is concerned with how a business can best meet customer needs and get paid for doing so (Richardson, 2008; Teece, 2007).

A sustainability-driven business model goes beyond this to include innovation in business modeling. This innovation delivers a way to survive, not only for firm but also for society and the planet. The meaning of "a way" (i.e. how) and "survival” in this definition is derived from organizational design and is socially constructed. It is broadly understood that sustainability in business modeling means models should lead to coexistence, complementarity, a better future and further growth to ensure balance and stability for all stakeholders concerned in value creation, delivery, capture, consumption, and recycling processes. Innovation in business modeling therefore includes both technological and societal innovation that aims to achieve long-lasting outcomes for economic, social, and ecological survival and compatible and balanced development.

However, value creation in sustainability-driven business modeling cannot necessarily be found in the operation of one firm; rather it is created, captured, and consumed across the value chain or network of organizations and stakeholders around the globe. Business value chains and operations are not confined to one country in the interconnected global business context, and thus sustainable business modeling requires multidimensional, multi-stakeholder, and multi-contextual perspectives designed to include the expectations, interests, standards, goals, and powers of multiple actors. As a result, a storytelling method becomes the most suitable way to present this complex and multidimensional reality.

Societal discourses and ideologies, and their policy implications in relation to sustainable goals, vary widely from country to country. As a result, the dimensions of sustainability which must be addressed in business modeling and the appropriate approaches to creating, capturing, and appropriating value largely depend on the cultural context shaping consumer purchasing decisions and the institutional rules of a given context (Rana and Sørensen, 2014).

For instance, in the last decade a surge in lithium-ion battery production has led to an 85% decline in prices, making electric vehicles and energy storage commercially viable for the first time in history. Batteries therefore hold the key to transitioning away from fossil fuel dependence, and are set to play a greater role in the coming decade that is likely to influence business modeling in different ways across different countries (see, Stevens, 2019).

Because of the institutional policies and rules in effect and the social discourses underpinning the auto industry, sustainability-driven business model innovation has been undertaken to reconfigure not only automobile technology but also the industry's entire R&D approach, cost parameters, market segments, competitiveness, process configuration, product platforms, and value chain management. Some electric vehicle companies, e.g. Tesla, have not limited their focus to battery technology and electric cars, but have expanded their attention to innovation in electrical grid technologies, batteries for "large-scale energy storage, vehicle charging infrastructure for going the distance, and supply chain management in order to maximize their competitive advantage. Companies that have developed new business models or reconfigured existing models for sustainable vehicle production have benefited from supportive institutional arrangements in those national contexts where social discourses, business ecosystems, and incentives inspired those companies to focus on consistent innovation, for example in the USA, China, and Japan.

In contrast, some companies in other countries (e.g., Germany) could not benefit to the same extent due to the lack of supportive institutional conditions, leading to slow advancement in product, process, and technology development as well as business model innovation (Ewing, 2019). This indicates that the development of sustainability-driven business modeling (SBM) is socially constructed, incorporating the expectations of multiple stakeholders and requiring a compatible institutional and ecosystem configuration. This helps to explain the variations in organizational capability development in designing SBM across different forms of capitalism.

Even in the electric vehicle (EVs) industry, sustainability-driven business modeling faces challenges in creating additional customer benefits, particularly to compensate for the higher initial investment compared to conventional cars. EVs could create such benefits by enabling more comprehensive mobility solutions, thus moving from product-based to service-based business models. For example, EVs may in the future serve as energy storage in so-called "smart energy"’ systems, and EV firms are already generating new revenue streams from battery leasing programs, and refurbishing batteries for second-use applications. Firms across and within different national contexts pursue different business models through a process of learning, experimentation, and adaptation (see, Bohnsack, Pinkseb, Kolk, 2014).

This research requires the adoption of storytelling techniques in order to explain the complexity and multiple realities in which the roles, actions, and institutional characteristics of multiple actors contribute to creating a certain reality.

 While business modeling emphasizes a holistic system-level approach and complementarity among different business stakeholders, business model has emerged as a new unit of analysis explaining both novelty and efficiency-centered design themes (Zott and Amit, 2008). A novelty-centered business model refers to new ways of conducting economic exchanges by connecting previously unconnected parties, by linking transaction participants in new ways, or by designing new transaction mechanisms. Digital technology provides support in executing this business model, because firms require a particular type of governance in order to ensure connectivity, the flow of information, and standardization among various parties.

In contrast, an efficiency-centered business model refers to the measures firms take to achieve transaction efficiency (i.e., reducing transaction costs for participants). This increase in efficiency derives from the reduction of uncertainty, complexity, or information asymmetry, as well as from reduced coordination costs and transaction risks. This stretching of the usual efficient-business model to be socially and ecologically responsible is also essential to the SEAM approach.

Both the business model and SEAM can therefore offer a competitive advantage in case it designed to offer distinct value from the competitors and link actors consistently with appropriate coordination for making value creation, appropriation and delivery process sustainable to attain the sustainability goals (Christensen, 2001). Casadesus-Masanell and Ricart (2010) refer to the business model as the “logic of the firm,” in the way it operates and how it creates value for its stakeholders, and argue that business models are made of concrete choices as well as the consequences of these choices. They contend that business models are composed of two different sets of elements: (a) the concrete choices

made by management regarding how the organization must operate; and (b) the consequences of these choices. The choices involved include compensation practices, contracts, commitments and promises, facilities, use and distribution of assets, the extent of vertical integration, and sales and marketing. Moreover, Casadesus-Masanell and Ricart (2010) argue that there are three types of choices: policy choices (e.g. a firm may choose to internalize its sales outlets rather than franchise); asset choices (e.g. the ownership of asset choices will be impacted if a firm internalizes sales and distribution outlets, as opposed to franchising or licensing); and governance choices, (e.g. the structure of governance including contractual or tacit promissory relational arrangements that confer decision rights, control, and commitment over policies or resource sharing as well as the condition of information and knowledge flow). Johnson, Christensen, and Kagermann (2008) argue that business models consist of four key elements: a customer value proposition, a profit formula, key resources, and key processes, which in turn include how both actors and activities should be governed and maintained.

These perspectives on business modeling that focus on decision-making, strategy, and management aspects as they influence the value outcomes. Sustainability-driven business modeling, however, must also include sustainable management aspects such as employee satisfaction, occupational health and safety, equality and diversity management, responsible management practices, shared value creation, and the legitimacy of the strategic activities that aim to earn acceptance from key actors (Rana and Sørensen, 2014, 2020). It is not enough, in a sustainability-driven model, to focus solely on profit and shared value creation to value chain actors as Porter and Kramer (2011) advocate .

In this regard, resilience thinking in management and business modeling for social and ecological systems must be considered a key component in understanding sustainability and the need for preserving natural resources in the face of external challenges (Xu, Marinova and Guo, 2015). Most studies tend to emphasize ecological aspects of resilience; however, human activities, management strategies, and resilience thinking in the modeling process can also inform sustainability in a meaningful way.

Business model innovation has seen a recent surge due to changes in research and business practices with an aim to attain sustainability. Changes to business models are recognized as a fundamental component of realizing innovations for sustainability, but this requires firms to have supportive organizational structures and dynamic capabilities (Evans et al, 2017; Teece, 2010). These are firm-specific advantages, but their realization depends on the ways in which institutional structures, market conditions, and industry ecosystems are organized, and how supportive these are of the organizational approach to sustainability-driven business modeling (Rana and Morgan, 2019).

Teece (2010) argues that the essence of a business model defines the manner by which the enterprise delivers value to customers, entices customers to pay for value, and converts those payments into profit. However, business model innovation emphasizes a system-level, holistic approach to explaining how firms do business and organize activities and strategies to create and capture value (Zott et al., 2011). Sustainability-driven business modeling is centered around the processes and designs that connect social and ecological sustainability to the creation of economic value, in order to promote long-term sustainability for both organization and society at large.

The reduced centrality of profit generation in sustainability-driven business modeling poses several intriguing challenges and requirements that storytelling science should consider. These include, but are not limited to:

1. The business model must include sustainability thinking (both social and ecological) at the heart of corporate strategy and resource management.
2. It must be commercially profitable.
3. It has potential for long-term success, not just in the shorter term i.e. skimming the cream.
4. It utilizes resources for the long term and focuses on long-term orientation.
5. It must ensure value for all stakeholders and earn legitimacy.
6. It must be open to learning and responsive to change, including the changing expectations of legitimating actors.
7. It must ensure diversity and resiliency in its reliance on resources, people, and investments.
8. Organizations using sustainability-driven business modeling must be less interdependent, and focus on modularity and effective governance so they can be insulated from unexpected events.
9. It has slack resources by which innovation and adaptation can be carried out to develop creative, explorative, and risky investments that aim to attain long-term social and ecological sustainability.

An example from the apparel industry, which is among the most polluting industries in the world, (Reimer and Rana, 2019), can better illuminate the complexity of sustainability-driven business modeling that requires the illustrative qualities of a storytelling perspective. Multinational apparel enterprises are rightly criticized for their ongoing damage to the planet, as well as their general failure to provide fair wages and adequate health and safety conditions for employees. In response to such criticism and in order to attain sustainability goals, Swedish company H&M has designed its business model and governance with the goal of reducing pollution and water consumption, while improving wages, workplace health and safety, and welfare conditions throughout the global value chain. At the same time, H&M has introduced a circular economy model to ensure post-consumption waste management of its apparel products. This illustrates that although H&M is addressing sustainability issues through mainstream business modeling and governance with its global supply chains, the company has also realized that post-consumption waste requires different business model to address ecological sustainability (Rana and Tajuddin, 2021). This inspired H&M to introduce an innovative parallel business model using circular economy concepts. Such initiatives are part of sustainability-driven business modeling. Due to its focus on sustainability modeling, H&M is pushing sustainability issues along the global value chain to the fore, even in crisis situations, such as the collapse of Rana Plaza in Bangladesh that led to thousands of worker deaths in factories that supply global brands from the UK, USA and Italy. The CEO of H&M was the first representative of a global brand to fly to Bangladesh after the incident, in order to conduct a timely inquiry and confirm that none of H&M's suppliers was impacted by the Rana Plaza collapse. Despite this, the company announced a support package for the victims and called for new transnational governance approaches for health and safety management. H&M further undertook serious new governance measures in their supply chain management in order to ensure fair wages, better health and safety conditions, reduced CO2 emissions and water consumption, and sustainable management (Imranul and Rana, 2020). Even during the COVID-19 pandemic, when market demand dropped rapidly in Western countries and led global brands to cancel orders from suppliers in sourcing countries, H&M pledged to continue buying from suppliers as part of shared responsibility in a sustainable buyer-supplier relationship (Cosgrove, 2020)

*The Capitalism Turn and Storytelling Science*

From the sustainability issues related to firms, people, and society, as illustrated in recent literatures, the question arises as to whether such issues are independent from the type of capitalism in which they emerge. Alternatively, we may also ask why sustainability issues arising in connection with firms’ behavior manifest differently and with different magnitudes across different societies. The answers to these questions require studies to consider the differing perspectives on capitalism in explaining sustainability issues in connection with firms’ behavior and business modeling strategies in different societies (see, for further explanation on capitalism, Wood and Allen, 2020; Rana and Morgan, 2019; Morgan et al. 2010).

Comparative capitalism literatures argue that the nature of institutional systems (e.g. state roles and policies, labor institutions, financial institutions, and skill development institutions), the interactions among these systems, and the interactions between these systems and businesses operating within them give rise to different forms of capitalism. For example, different conditions emerge within a liberal market economy (USA and UK), a coordinated/cooperative market economy (Germany, Japan), a collaborative market economy (Denmark, Sweden), and an incoherent/fragmented market economy (Greece, several emerging economies) (Rana and Morgan, 2019; Morgan and Kristensen, 2015). Such variations in capitalism and market structure contribute to variations in income and inequality in society, in the consumption and appropriation of natural resources, and in the ways in which local and multinational firms behave toward sustainable initiatives (Wood and Allen, 2020).

Rana, Allen, and Jiajia (2018) argue that home and host country institutions and firm ownership structure, including governance, influence multinational enterprises (MNE) subsidiaries to design local sustainability strategies. Their study demonstrates how UK-based GSK and Denmark-based Novo-Nordisk have been able to design different local strategies in collaboration with market and non-market actors in order to include locally relevant societal and economic goals in their business modeling strategies. This has in turn led to the long-term legitimacy and survival of Novo-Nordisk in Bangladeshi business systems, while GSK had to shut its Pharmaceutical operation due to contrasting strategy (i.e. low level of collaboration with market and non-market actors) shaped by HQ decisions and business modeling. Thus, we can conclude that firm structure and contextual forms of capitalism shape how a firm is able to adopt sustainability in its business modeling. Storytelling science can help us to better grasp this complexity and better understand these realities.

While many firms claim to address sustainability issues through corporate social responsibility (CSR) initiatives, this may turn out to be a window-dressing strategy concerned only with improving the company's image. The particular forms of capitalism at play in multinational firms' home countries tend to inspire inclusion of sustainability in business modeling through CSR and other strategies, but firms often behave differently in foreign markets, under different structures and different forms of capitalism. This often leads to paradoxical or questionable behavior. The example of Norwegian firm Telenor may illuminate this dimension. Telenor addresses social and economic sustainability issues in its business modeling in the home region; however, the company has been implicated in misconduct in relation to environment, labor rights, and local laws in Bangladesh (Rana and Paivi, 2017). Surprisingly, the company carried out several CSR activities at the same time that it was weakening its compliance with social and legal standards; this was possible because of the weaker institutional context in Bangladesh that does not necessarily ensure sustainability standards paralleling those in Scandinavia.

Sustainability-driven business modeling and strategies are thus socially constructed within contextual forms of capitalism and internal firm structures. Hence, sustainability studies that plan to use a storytelling science perspective should consider capitalism literature, particularly that relating to ecologically and socially responsible capitalism, in explaining the issues and mechanisms of sustainability and business (modeling) strategies. Narratives and antenarratives can be better reflected and explained if studies take into account the antecedents and characteristics deriving from capitalism. Storytelling method can help narrate and explain the sustainability-driven business modeling strategies of firms- particularly those which illuminate the *between* and *becoming* in a certain context in connection with the *before*, *beneath*, and *beyond*.

*The Communication Turn in SBM and Storytelling Science*

Storytelling is a process by which a series of events is transformed into a story or narrative and expressed to its audience. This is not a neutral process; it is a bid or attempt to reshape opinions, create shared realities and understandings, and spur action. Through storytelling, the individual actor attempts to influence the world using narratives and communication. Storytelling is therefore crucial to an organization’s value and value proposition mechanism as stories express the impression that stakeholders and owners have of a company in terms of trust, quality, reliability, efficiency, and development. These views are formed in the context of specific forms of capitalism which in turn shape firms and their strategies.

It is thus important not only in business modeling but also in a company’s communications—including advertisements, annual reporting, sustainability reporting, company websites, and digital media channels. By using a storytelling science approach, a company can work to develop a reality, discourse, or truth about how the company cares for the consumer, society, and the world. It should be noted that at times, storytelling may have a tarnished image and reputation because the audience may perceive that there is no connection between what a company says or promises and what it actually does, as described in the Telenor case above. Weak institutions and fragmented capitalist systems may make firms more likely to opt for such opportunism and misrepresent reality in their reporting. Many multinational companies tell pleasant stories in their CSR and sustainability reports in order to present the image of a sustainable firm, while their actions reflect the complete opposite. This creates a negative image of the company for stakeholders. Companies wishing to engage in an honest storytelling approach should work systematically from a holistic perspective, in which micro, meso, and macro institutional factors are taken into account to explain *beneath*, *between*, *becoming*, and *beyond* factors as part of truthful communication with the public.

1. ***Methodological and philosophical perspectives of storytelling science and SBM***

Storytelling science is rooted in the philosophy of pragmatism, which is particularly evident in the work of C.S. Peirce. The method, as we have described in passing, is a self-correcting AID (abductive-inductive-deductive) approach. This is accomplished in phases, working out the abductions, the induction tests to use at the beginning of the research process, and the deductions made ahead of the fieldwork.

Popper was familiar with the work of C.S. Peirce in self-correcting inductions, and both proposed similar ways to test induction in relation to deduction and hypotheses (though Peirce preferred to call the later *abductio*n or *retroduction*). We believe that future studies applying a storytelling science perspective in business modeling strategy can benefit from applying the following four tests:

1. Test One: try through acts of self-reflection to dismiss, refute, or falsify the logic, methods, or precepts of a business modeling strategy. If that does not work, move on to the second test
2. Test two: Engage other people (relevant informants) in conversations, focus groups, or interviews about the business model's value propositions, mechanisms, and consequences to see whether self-corrective induction is true or not. If this disproves the theory, method, practice or logic, stop. If not, go on to the next test.
3. Test three: Use the laws of nature, as understood across various scientific disciplines, in order to assess the strategic assumptions and logics of the business modeling. If this does not refute the current understanding of the strategy, proceed to the final test.
4. Test four: Conduct interventions and or experiments that test the business modeling strategy's assumptions or logics using deduction.

The tests of inferences (abductive-inductive-deduction) depend on what we call the storytelling science of self-correction (Boje & Rosile, *in review*). Karl Popper was particularly concerned with not making inferences that are *post-hoc*. Instead, like Peirce, he preferred making antecedent predictions that could be tested and potentially refuted. Indeed, Popper (1994) was concerned that theorists did not buy into the “myth of the framework.” Peirce described the relationships between his three kinds of induction as follows:

1. **Crude Induction**: this does not include acts of refutation of one's deductive theory, abductive propositions, or inductive tests (e.g. sampling cases). In assuming linearity, the beginning-middle-end structure of crude induction misses complex dynamics and often leaves out important events, histories, and characters necessary to a full understanding of how complex adaptive and living systems operate.
2. **Quantitative Induction**: What is the "actual probability" that an individual member of a population will have the same pattern of causes and effects as the population overall? Peirce advocated repeated sampling, in order to avert the inductive fallacy we now call the black swan effect. Just because all the swans sampled have been white does not mean the next sample will not include a black swan.
3. **Qualitative Induction**: There is an intermediate approach between Crude and Quantitative Induction, and a way to integrate them rather than treating them as either-or. Qualitative Induction comprises those inductions that are neither founded on experience in one mass, as Crude Induction is, nor upon a collection of numerable instances of equal evidential values, as Quantitative Induction is. Instead, Qualitative Induction is built upon a stream of experience in which the relative evidential values of different parts must be estimated according to our sense of the impressions they make on us.

It is like “predictions,” being antecedent (i.e. coming before in time) and investigator’s knowledge of their own truth and other’s truths, as the truth-making negotiations occur (and mostly never are completed).

Even assuming the successful collection of innumerable cases of equal evidential value of different parts of complex system such as a supply chain or value proposition mechanism, the carrying capacities of the planet for the whole system can still only be understood by estimate. We first deduce such an estimate from an abductive assumption, making sure that the planet and social system will not be harmed, then pin down the tests, and make the deductions through a modeling approach that does not leave out parts of the system as a whole.

1. ***Drivers, Enablers, and Barriers of Implementing SBM:***

Researchers using storytelling science can benefit from an understanding of the forces driving and impeding the implementation of SBM. At this point in dynamic global markets, the development of sustainability-driven business modeling is primarily driven by the desire to gain a competitive advantage through corporate sustainability, particularly for large multinationals modeling. Sustainability is rarely positioned as a firm's core corporate strategy; however, it is common for firms to view sustainability as a driver in business modeling in two ways.

In the first type, firms are proactive in embracing sustainability as a core corporate strategy, and thus they design organizational structures, governance, operations, and products accordingly in compliance with sustainability goal(s); they refer, for example, to UN or national sustainability goals. However, this is not a linear approach in adopting SBM, as firms’ existing business models predate the focus on sustainability. Instead of changing the entire existing business model, which is a difficult and risky proposition, firms tend to introduce a parallel sustainability-driven business model and continue the existing business model by incorporating sustainability concepts into its operational strategies as deemed suitable. The aim is to transform the entire organizational structure, business operation, management, and product marketing towards a sustainability-driven business model over a defined period of time. As highlighted above, in this case firms appear to be proactive in their strategic decision-making, trying to reconfigure their asset bases, management, governance structures, operations, and technological capabilities in order to make it happen.

These types of firms are driven by corporate visions of sustainability and sustainable strategic management, market and societal legitimacy, changes in institutional policy and consumer perception, reputation and branding, competitive advantage, welfare and responsible business attitude, etc. An example of this kind of firm is H&M, which has adopted sustainability into its existing business model along with introducing a circular economy concept modeling as a parallel approach that aims to transform the entire organizational structure, operation, and business model into a sustainability-driven approach. Within proactive approach, firms develop their business models by keeping the mission of sustainability at the core of business plans and business model designs. Thus, they pursue sustainability as a core mission of their ventures. Many start-ups and SMEs taking advantage of institutional incentives are starting ventures under this category; for example, "Better World Fashion" sells leather fashion goods based on used leather apparels using a circular economy model as prescribed by the Ellen MacArthur Foundation (see, Ivang and Rana, 2019)

In the second type, firms are reactive to external forces related to sustainability rules, policies, customer perceptions, collaborating partners’ expectations, changing practices, and market competition dynamics. Transnational or multilateral institutions (e.g. UN, EU, WHO) are increasingly forcing national institutions and MNEs to comply with sustainability goals by pressing them to develop rules and practices that fit with UN agenda. In turn, these goals impact standards and key performance indicators of production, operation, process, supply chain, products, and waste management (which involve, for example, CO2 emissions and water consumption), human health and welfare, poverty, inequality, etc. These external pressures are forcing firms to reconfigure existing business models to earn internal, external, procedural, and product legitimacy—especially for firms involving in global operation and marketing (Rana, 2015).

Firms of this type feel pressure to adapt to sustainability issues and requirements, integrating green concepts and specific sustainability agendas into organizational structures, strategies, operations, and value propositions in order to fit with changes in institutional regulations, standards, market characteristics, and customer expectations. Firms of this type tend to reconfigure their existing business models to fit with the sustainability-driven agenda and key performance indicators as much as they can, but are unlikely to be able to address sustainability goals entirely.

In both cases, firms must have dynamic capabilities in order to sense changes and new expectations across markets, institutional fields, and business systems, seize the capabilities and resources required for changing or innovating the business model, and reconfigure the existing organizational design, strategies, operations, resource allocation, and management for innovation and change (Bocken, and Geradts, (2019). Danish firm Bestseller is a good example of this; the company has adopted sustainability issues into its existing business model and is redesigning products in order to meet the market and institutional expectations.

 Organizational design, which includes the process of aligning the structure of an organization with an objective of improving efficiency and effectiveness, is one of the key foundations as well as challenges in developing and implementing SBM. This process of alignment requires firms to have supportive ownership structures. There are various forms of ownerships, such as family ownership, pension funds, business angels, bank or capital market financing, institutional investments, etc. and each form contributes to different structure and vision leading to variable efficiencies in management and governance and resource capabilities (technological, management, and financial) as well as strategizing. The owners or firms should not only be able to sense the need for change and the path toward achieving it through reconfiguration and innovation, but must also be able to implement the business model and strategies in pursuit of corporate success and the firm’s legitimation. Determining where to focus on a sustainability agenda and how to operationalize this agenda is a key challenge for firms, as innovation entails high risk in terms of investment, market share, revenue, and change management.

Many organizations, particularly technology-rich firms, tend to use big-data or small-data analysis using artificial intelligence in order to understand what competitors are doing, what institutions and customers are expecting, and how these contextual facts are changing (Nielsen & Lund 2019). The experiences and intuitive capacities of entrepreneurs or top managers play a vital role in sensing the right ideas and methods for innovating or reconfiguring organizational designs and business models.

The biggest challenge in sustainability-driven business modeling, however, is in optimizing balance and complementarity between sustainability-oriented visions and practices, and corporate revenue goals and legitimacy. Often shareholders are not ready to accept the decision to shift to SBM as it is likely to result in revenue and profit loss in the short term, even if it could be lucrative in the longer term. Foundations or pension funds that own significant shares of large firms, which are common in Denmark, are interested in long-term investment for sustainability driven business modeling in cases that show promising market position and competitive advantage. However, this is not the case in many countries. As a result, large MNEs whose key shareholders are striving for short-term profit maximization are prevented from innovating or reconfiguring organizational structures for an SBM that may hamper immediate revenue or require high investment that affects profitability.

In such cases, larger firms tend to prefer models of corporate social responsibility that reflect a limited sustainability agenda sufficient to fulfil the local and multilateral institutional requirements and establish a positive local image and legitimacy. Cost is therefore one of the biggest challenges that many firms face in innovating or developing SBM, and this is applicable across many emerging economies where national institutions do not have necessary support systems, incentives, and consistent ecosystems to support the development of SBM (Rana and Sørensen 2020; Rana and Allen, 2018).

However, it is not only state support and consistent industry/ecosystem development that shapes how and whether firms can emphasize sustainability in business modeling, but also consumer perception. As sustainability development involves risks and high costs, though institutional rules are in place, if the consumer mindsets and perceptions are not consistently in line with sustainability, investment in sustainable product development and operation may not be seen as beneficial even where institutional supports are in place. Consumers may not be ready to pay the price or perceive the value proposition as differentiated and unique, thus leaving no impact on the competitive advantage for firms in competition. However, differences in ownership structure and governance, particularly in global firms, underpin how MNEs would configure SBM.

A comparison between two MNEs can better illuminate this argument. H&M and Inditex (owner of the Zara fashion brand), two global firms in the apparel industry, have addressed sustainability differently in their business modeling due to differences in the ownership structures of their respective retail stores and in the ways they govern suppliers. Although H&M and Zara both sell apparel, H&M primarily sells low-cost work wear while Zara primarily sells higher-priced fashions and work wear. Both firms intend to respond to the emergence of fast fashion as an industry trend in nearly 70 countries. H&M has introduced a separate circular economy model parallel to its existing business model, and has undertaken initiatives to reduce CO2 emissions and water consumption and increase recycling of clothes. It has been very successful in this regard, due partly to the fact that it owns nearly all 4,900 of its stores and thus can ensure the quick collection of used clothes. However, it does not own any of its suppliers and has developed arms-length governance relationships with nearly 800 suppliers across Asia, Africa, Europe, and Latin America. Thus it cannot force all suppliers to comply with circular production and sustainability operations. Sourcing from distant locations has increased H&M’s lead times (adding, on average, two weeks) to bring fashions to the market, making it slower in responding to fashion changes than Zara. However, this externalization of supply networks has reduced the cost of production and investment for H&M.

On the other hand, Inditex has internalized its product network, and owns most of its suppliers located in geographical proximity to its headquarters, i.e. in Turkey, Spain, Portugal, and Eastern Europe. Thus, it has an advantage in being able to bring fashions to the market faster than H&M—albeit at a higher cost and with more intensive management requirements. Thus, it is easier for Inditex to reconfigure the supply network to introduce circular production compared to H&M. However, as Inditex only owns one-third of its retail stores, its volume of used clothes collection is not as high as H&M's. This is the reason H&M introduced a separate circular business model, working with the smaller selection of suppliers who could afford to reconfigure their production and operations management, while Inditex could institute such a change internally. However, both have been very serious in responding to climate change issues in operations and business modeling.

Although many global firms are working to develop sustainability-driven business models, they cannot all implement strategies used in SBM in the same wayin all countries, and neither can they offer the same value proposition in the same ways, because of the differences in regulative, normative, and cognitive institutions and markets. Thus, adaptation, capability development, and legitimation are the key factors that global firms should take into consideration in order to embrace and apply sustainability agenda in business modeling and organizational design.

**Conclusion:**

In this chapter, we have provided a conceptual overview of a sustainability-driven business modeling (SBM) strategy within a storytelling science paradigm. Storytelling science uses C.S. Peirce’s AID approach in an iterative stages of self-correcting investigative cycles, in order to deconstruct regimes of truth about sustainability that are unjustified, or fail to account for carrying capacities. While there are always multiple versions of a given story, some maybe truer and more artificial than others. We have shown that storytelling science can be a useful tool in accounting for the variations and characteristics of firms and surrounding forms of capitalism can impact SBM. We have also proposed ways of integrating storytelling science with SBM, and described the methodological and philosophical perspectives in SBM research. Finally, we have presented a extensive discussion as to how drivers of and barriers to implementing a sustainability-driven business modeling strategy can be understood; namely, by focusing on what is socially and ecologically sustainable rather than only on what is profitable.

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