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Can fashion be sustainable? Trajectories of change in organizational, products and processes, and socio-cultural contexts

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ABSTRACT

This article conducts an in-depth exploration of the current landscape of fashion sustainability, providing a comprehensive framework that contextualizes the subsequent contributions that comprise this Special Issue. By delineating three pivotal dimensions of action, we set the stage for a nuanced examination that reviews the realms of organizational change, innovation within fashion products and processes, and the tangled interplay of socio-cultural transformations. These dimensions collectively lay the foundation for a holistic analysis of how the fashion industry navigates the complexities of sustainability, encompassing shifts in management paradigms, advancements in design and production, and cultural factors that underpin the sustainable fashion discourse. Through an extensive analysis, the article not only presents a panoramic view of the current state of the art regarding fashion and sustainability but also constructs a robust conceptual framework that serves as a guiding compass for navigating the subsequent sections within this Special Issue. This framework is designed to encapsulate the multiple facets of sustainability within the fashion domain, acting as a roadmap to discern and understand the evolving landscape. This lens invites readers to journey beyond the surface, delving into the perspectives that define the transition toward a more sustainable fashion future.

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Introduction: a holistic approach to fashion sustainability

Global fashion, as part of the cultural and creative industries (CCI), represents a rich and advanced manifestation of contemporary culture and simultaneously embodies a complex and layered set of socio-technical relationships. On one hand, fashion is a sophisticated expression of our society that is a melding of different languages and artistic disciplines, widely perceived as a “cultural media,” and pervading and informing social practices and dynamics. Indeed, it has been an important component of societal evolution and costumes have always been important elements of acculturation processes of all communities. In its contemporary manifestation, fashion is a “tool” of cultural mediation between the individual and the social environment, contributing to defining subjective and collective identities.

On the other hand, fashion is one of the oldest manufacturing sectors in Western countries, part of their industrial roots, and still a critical component of economies with a globally significant scale of impact. The industry has been at the core of several

consecutive technological revolutions, contributing to – and sometimes accelerating – globalization processes, producing various deleterious effects through concurrent processes of cultural homogenization and impoverishment, as well as deeply affecting the quality of the environment to the point where today it is the second most polluting industry in the world (Huynh 2022).

These two dimensions of fashion are currently colliding because of the rise of digitalization and the increase in access to information. Electronic communication channels have been amplifying the friction between fashion narratives, the extensive and pervasive impacts of the industry and its allied activities, and the search for authenticity. The public has begun to demonstrate heightened awareness and these new sensibilities have begun to change customers’ attitudes toward consumption choices, thus increasing the demand for transparency on the part of commercially visible brands. In the face of these challenges, the established pillars of the global fashion industry have struggled to reinvent their business models and related modes of storytelling and the

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prevailing situation has given rise and legitimacy to several alternative voices.

These novel expressions are emanating from a lively ecosystem of startups that are organized around new sets of values informed by sustainability. Further disruption is being driven by the activities of a growing community of “fashion activists” and nongovernmental organizations (NGOs) which are reframing the global discourse. The COVID-19 pandemic has quickened ongoing transformation and overturned preexisting commitments. The global fashion system – comprising both its facets of production and consumption and its negative social and environmental consequences – is being critically questioned even by authoritative figures at the center of some of the most iconic and successful brands. Therefore, the quest for more equitable and sustainable fashion consumption-production practices and models is of paramount contemporary relevance.

Originating in the 1980s (WCED 1987), the notion of sustainable development has undergone significant evolution over the intervening decades. Initial attempts to define its parameters were made through various lenses of social, political, economic, and ecological thought. These perspectives, though insightful individually, failed to coalesce into a comprehensive and unified understanding of sustainability that encompasses the intricate web of social dynamics, the delicate balance between humans and nature, and the underlying values and beliefs that shape our worldview.

In some instances, sustainability has been subsumed within existing economic frameworks, merely serving as a rhetorical flourish rather than an actionable principle. This is particularly evident in neo-classical economics, where sustainability is often relegated to a secondary role, failing to prompt substantial changes in actual practices.

When engaging with the concept of sustainability today a fundamental factor is the intrinsic interdependence and interrelations that pervade the systems under consideration. This acknowledgment gives rise to the characterization of these systems as holistic in nature, wherein the components and constituents cannot be contemplated in isolation, but rather must be comprehended as integral parts of a unified whole.

Within the context of sustainability, a holistic orientation is imperative (Williams et al. 2019), extending its significance to both theoretical frameworks and practical applications. What does the embrace of such an approach entail? It underscores that each notion, venture, and attempt undertaken carries ramifications that reverberate through the entirety of the encompassing system. The profound implications arising from this interrelation imbue

the realm of sustainability with richness and complexity.

In essence, a holistic approach obliges a departure from reductionist thinking – wherein isolated components are dissected and analyzed out of context – to a comprehensive understanding of systems as cohesive wholes. Such a holistic framework acknowledges that any alteration, regardless of its scale, within a particular facet of a system, ripples throughout the entirety of that system, generating repercussions that are elaborated and often unforeseeable. Thus, any pursuit of sustainability mandates cognizant consideration of this profound interconnectedness.

This holistic perspective becomes particularly salient in the domain of sustainability. It highlights the interconnections of ecological, social, economic, and cultural elements, emphasizing their symbiotic interactions. Environmental changes cascade through socio-economic structures, cultural shifts influence resource-consumption patterns, and economic decisions shape and are shaped by ecological trajectories. Consequently, adopting an integrative perspective serves as a compass with which to guide sustainable efforts.

A holistic approach to sustainability introduces a transformative paradigm. Central to this approach is the concept of a more-than-human conception that overrides the human-nature dualism (Abram 1996, 2012; Bellacasa 2017; Haraway 2008, 2015). It entails a comprehensive restructuring of societal frameworks, one that bridges the chasms between environmental protection, economic viability, social equity, and cultural preservation.

The holistic perspective on sustainability places a premium on respecting environmental quality and the natural limits of our planet. This fundamental ethos is interwoven into every facet of society, from economic structures to political frameworks, educational systems, and cultural narratives.

First, environmental sustainability encompasses humanity’s adeptness at abiding within delineated biospheric parameters, concomitantly acknowledging the demarcated planetary confines, as articulated by Rockström et al. (2009). This construct intertwines with ecological precepts and diverse methodologies that inherently validate humans as one of the constituents of the natural order, but not the only one.

Second, economic sustainability refers to the ability of individuals to maintain living standards within agreed-upon limits, considering factors like wages relative to living costs and income disparities. This concept promotes a balanced relationship between productivity, employment, and economic status.

Third, social sustainability involves a community’s ability to interact harmoniously, fostering a sense of unity. It encompasses various settings – such as places,

communities, and organizations, whether formal or informal – along with their available resources, opportunities, and challenges. This concept revolves around empowering diverse individuals to express themselves and take independent actions, all while maintaining a harmonious coexistence with others.

Finally, moving from the publication of Agenda 21 (United Nations 1993), the addition of cultural sustainability (Hawkes 2001; Nurse 2006; UCLG 2010; Sabatini 2019) as a fourth pillar to the triple-sphere framework encompassing ecology, economy, and equity completes a contemporary holistic vision of sustainability. Cultural sustainability involves creating inclusive systems that appreciate and foster diversity. This applies to various communities, places, and belief systems and it includes using different methods to protect the cultural heritage, beliefs, practices, and histories of the different communities. The goal is to ensure the continued existence of these communities while respecting their integrity and including them in the discourse.

Based on these four pillars, the holistic perspective reframes sustainability as a complex and multifaceted development paradigm. This multidimensional model strives to harmonize economic progress and human activities with the regenerative capabilities of nature. Anchored at its core is the aspiration to uplift the human condition through social and human development, while concurrently upholding respect for environmental well-being and the boundaries set by nature. This holistic vision ushers in fundamental shifts across social, economic, political, and cultural domains, necessitating the transformation of present-day society itself.

A fundamental shift underpinning the holistic approach is the recognition that sustainability hinges on interconnectivity and coordination among diverse agents and factors. This demands a recalibration of power dynamics in decision-making, fostering collaboration between public and private sectors, international bodies, local communities, and other stakeholders. In this manner, the holistic framework acknowledges and honors the interests, values, and knowledge of all involved parties.

Another core facet is the imperative to reshape wealth-distribution patterns, ensuring greater equity and the eradication of unjust economic practices. This involves dismantling systems that perpetuate inequality and poverty on a global scale, ultimately striving to satisfy the needs of all individuals, especially the marginalized.

The holistic approach additionally underscores the need to redefine humanity's relationship with nature. It urges a shift away from viewing nature and its resources as limitless tools for human gain. Instead,

nature's intrinsic purpose, independent of human needs, is emphasized. This reorientation away from an anthropocentric view fosters a universalistic perspective that interlinks all planetary elements in a harmonious, interdependent whole.

The principles of intergenerational equality and ecological responsibility further underscore the holistic approach. Respect for both the rights of both current and future generations to a healthy environment is paramount, necessitating productive systems that coexist harmoniously with nature's regenerative capacity.

Furthermore, a new international order must be established, characterized by just global wealth distribution and equitable relations among nations. The holistic framework also places ecological limitations at the forefront, requiring economic growth to be aligned with nature's capacity for self-regeneration. Moreover, the empowerment, self-sufficiency, and preservation of the cultural identity of local communities are integral aspects. The holistic approach champions strengthened decision-making capacities within communities, bolstering their ability to chart their own paths to sustainable development. Finally, and crucially, the holistic process embodies an inseparable union between theory and practice, continually evolving and refining as circumstances change.

Redesigning the fashion system within this holistic sustainability framework is imperative due to the profound environmental, social, and ethical challenges posed by the traditional manifestations of the industry. The current fashion system is characterized by a linear model of production and consumption often known as "take-make-dispose," where resources are extracted, garments are manufactured, and the clothing is ultimately discarded after a short lifecycle. This approach leads to excessive resource utilization, significant waste generation, and pollution, contributing to environmental degradation and climate change. Moreover, the fast-paced nature of the fashion industry promotes overconsumption, exploitation of labor, and a lack of transparency throughout supply chains. These issues perpetuate social inequalities and human-rights violations, especially in low-wage garment-producing regions.

Embracing sustainability necessitates a systemic shift that rethinks every facet of the fashion ecosystem. Redesigning the fashion system means adopting circularity principles, where materials are reused, recycled, and regenerated to minimize waste and extend product lifecycles. It entails fostering transparency and ethical practices throughout the supply chain to ensure fair labor conditions and to promote social justice. Additionally, it involves considering the broader ecological impacts of production, distribution, and consumption, with a focus on

minimizing carbon emissions, water usage, and chemical pollution.

This work to reconfigure the fashion system aligns with the broader global effort to achieve the United Nations Sustainable Development Goals (SDGs), addressing issues such as climate action, responsible consumption and production, decent work and economic growth, and reduced inequalities. As consumers become increasingly conscious of these issues, fashion brands that prioritize sustainability not only contribute to a healthier planet and society but also position themselves for long-term success in a changing market landscape. This transformation is essential to create a fashion ecosystem that operates in harmony with people and the planet.

The triple transition

Development of the notion of a triple transition stems from the concept of transformation toward more environmentally sustainable frontiers promoted by the European Union to overcome the past and future emissions risks burdening our climate (Fouquet and Hippe 2022). In this scenario, many sectors negatively affect the global environment. Within the fashion system, the fast-fashion model is heavily criticized from the standpoint of environmental and social sustainability. It is characterized by its extremely complex supply chain and particularly intensive production and consumption cycles (Niinimäki et al. 2020).

Despite the strategies implemented within the fashion system in recent years to reverse its consumerist inclination, analysts define fashion as the most change-intense category by the very nature of the meanings attached to it. Indeed, the consumption of fashion products is motivated by a perpetual need for style renewal under the pressure of new trends. In this regard, an alarming prediction estimates that the global annual consumption of garments will reach 62 million tonnes by 2030 (Hur and Cassidy 2019). This ephemeral character *de facto* has made the fashion industry, as mentioned above, the second most polluting industrial branch in the world (Huynh 2022), and it stands out for being the most intensive manufacturing sector in terms of water consumption. The fashion industry additionally is responsible for 20% of water pollution due to fabric-dyeing processes and contributes 35% to ocean contamination because of the dispersal of microplastics that derive from the industry's production and waste. Fashion moreover accounts for 10% of global production of greenhouse-gas (GHG) emissions (Niinimäki et al. 2020).

This worrying data highlights the urgent need for an effective transition to a circular economy, as a

restorative economy that relies on renewable energy and is oriented toward eliminating toxic substances as well as minimizing and addressing waste through careful design (EMF 2013). This type of economy can be driven by circular business-model innovation capable of channeling within it the threefold aspect of the economic structure, based on the mutual relationship between the economy, environmental issues, and sustainability (Pieroni, McAloone, and Pigosso 2019).

This shift toward a greener economy can be concretely supported by a second key driver of transformation, namely digital innovation and its related emerging technologies which can enable effective reduction of industrial environmental impacts (Muench et al. 2022). The aim of this strategic intervention aspires to minimizing the use of virgin resources and drastically reducing the production of new waste by focusing on the core concepts of reduction, reuse, recycling, recovery, and remanufacturing, thus shifting the focus from the linear “take-make-dispose” model to the circular “make-use-return” paradigm (Huynh 2022). Notwithstanding the necessity of this structural change, it must be noted how its actualization is antagonistic to the fashion economy. The term “sustainable,” as associated with longevity and durability, stands in a paradoxically contrasting relationship with what turns out to be the consumerist prime mover of the fashion sector, namely continuous renewal of stylistic criteria (Hur and Cassidy 2019). This observation highlights the need for a parallel reconfiguration of the fashion-value chain to effectively innovate its business model.

To facilitate the transition to a circular paradigm, the European Commission outlined a new growth strategy in 2019 called the “European Green Deal” to encourage the evolution of European Union (EU) member states to become promoters of a new model of fair, prosperous, modern, resource-efficient, and economically competitive development, intending to bring GHG emissions to zero by 2050 (European Commission 2021).

This intervention is an integral part of the action plan to implement the United Nations 2030 Agenda and the sustainable development goals (SDGs). The driving force behind the profound socio-economic changes that underpin the European Green Deal is a process of digital transformation and an associated toolbox (European Commission 2019). Diffusion of these instruments is intended to enable a shift from the current linear economy model to a circular model, characterized by the use of resources in a closed and continuous cycle, thus giving rise to a new economic paradigm (Ortega-Gras et al. 2021).

The massive adoption of technological resources (e.g., artificial intelligence, 5G networks, Internet of Things) in the process of transformation implies a

twofold effort that is summarized by the challenge of the digital and green transition, termed the Twin Transition (European Commission 2022a). The combination of these two phenomena with profoundly diverse natures and structures allows them to reinforce one another through integration and mutual support. The role of technological assets within this changing context is to offer new forms of concrete support for supervision of the production chain, employing the creation of digital passports and greater accessibility to data control and automation of processes, to foster innovation and enrich processes and production with new values (European Commission 2022a).

A third component promoting transformation, namely resilience, has been added to the ecological and digital dimensions of change, thus effectively moving from a Twin Transition to a Triple Transition (European Commission 2022b). The need to implement the transformation strategy with this element of stability has become quite evident in the last five years. Indeed, the recent Russian invasion of Ukraine has highlighted the urgency of developing a structured and resilient energy-supply system. In addition, the emergency caused by the COVID-19 pandemic already shifted the policy and planning focus to the need to rely on a more robust logistic structure and supply-chain relations (European Commission 2022a). While originally developed in the early twentieth century, the concept of resilience was mainly inherent to materials science, in particular textile research, as it was defined by Hoffman (1948) as “the ability of something to return to a reference state following a disturbance of some sort” (Thorén 2014). During subsequent decades, the concept has been extended over time to various fields, particularly within the disciplines of psychology and ecology. In both cases, the connotation attached to the word has some common features. In the case of the human mind, it refers to the ability of individuals to recover following trauma, to withstand stress and people’s ability to progress through the stages of psycho-cognitive development despite an adverse environment (Thorén and Persson 2015). In the ecological sphere, the word usually refers to the work of Holling (1973) who distinguished resilience from stability, attributing to the latter a pivotal role within a system as it is capable of absorbing and reacting to changes (Thorén 2014; see also Folke et al. 2010).

The fundamental pillars of resilience in this sense are adaptivity (the ability to elaborate responses concerning external agents and internal forces) and transformability (the ability to cross the boundary to develop new trajectories) (Folke et al. 2010). This

reading of the phenomenon is what allows for the definition of its role within the triple transition, as a link between the two trajectories of innovations identified by the European Union. Resilience appears to be necessary because of the support it offers to cope with the extremely precarious and frail condition of the contemporary context and to reestablish the center of equilibrium in the changing socio-economic paradigm, generating new solutions in response to possible instabilities afflicting the structure of the system (Folke et al. 2010).

Given this background of change and the consequent new openings by the European Commission, the “New European Bauhaus” strategy occupies a central position, designed to be the catalyst for the objectives of the “Green Deal” and to make them tangible and consistent with the cultural and human dimension (European Commission 2023). It is a medium that aims to incorporate and convey within it the various dimensions of sustainability, the prospect of technological development, and the quality of living in the environments in which people inhabit, through the concrete creation of a new lifestyle based on “good design” as a promoter of sustainability values (European Commission 2023).

The concept behind this strategy is to repropose in a contemporary key the main idea and theoretical basis of the historical “Bauhaus” which introduced in the period following World War I and the first two industrial revolutions a new paradigm of disciplinary transversality involving the scientific, socio-cultural, architectural, and design dimensions of the contemporary era (Sadowski 2021).

Similarly, the configuration of events characterizing the last 25 years, such as the climate crisis, the COVID-19 pandemic, and the introduction of new and advanced technologies, provided the impulse for the definition of a novel conception of the “New European Bauhaus” presented in 2020 by the President of the European Commission, Ursula von der Leyen, to repropose the conjunction between, on one hand, the worlds of science and technology and, on the other hand, that of art and culture (Ness 2021). The similarities between the two institutions are not limited to disciplinary transversality but extend to a desire to seek a coupling between digital innovation and the arts within the framework of a contemporary changing society.

According to interpretation, it is possible to hypothesize a connection with what were the three characteristic phases of the Weimar movement, passing from Walter Gropius’ transdisciplinary vision, to Adolf Meyer’s interest in collective well-being, and finally to Ludwig Mies van der Rohe’s emblematic concept of “less is more,” applicable to the current

view of resource preservation in terms of design planning (Ness 2021). At the heart of this new European strategy, design assumes the role of a new idea incubator, with a dedicated focus on sustainability through social participation (Rosado-García et al. 2021), effectively rethinking the relationship between economy, culture, and society and fostering recognition of culture as the fourth pillar of sustainable development, alongside the social, environmental, and economical pillars. Referring to the status quo, culture can be framed as a mediating force encompassing cross-sectionally with all the other pillars to achieve a comprehensive understanding of sustainability.

The contextualization of these criticalities and the analysis of the newly emerging trajectories of innovation leads to the recognition of a gap which can be addressed through design to identify a new strategic model able to provide concrete support to sustainable transformation. The theme of the triple transition can be debated via design-driven innovation as a methodology capable of depicting environmental and social evolution, identifying cultural and technological drivers and patterns of change, and guiding – through the stages of the design-thinking process – the innovation of products, services, systems, and processes toward a more equitable and sustainable vision of the future.

Modeling the triple transition through design

Within the above-mentioned framework, design thinking performs the role of the driver of innovation. While four different pivotal factors – social transformation, cultural revolution, technological/digital innovation, and environmental change – lead to value-driven innovation through the design approach. The specific nature of this type of innovation is its ability to recognize and acquire awareness not only concerning the utilitarian, but also the emotional, psychological, and socio-cultural contemporary value-reference system (De Goey, Hilletoft, and Eriksson 2019). Furthermore, due to its ability to combine and recombine resources during transformation phases in addition to its human-centered focus, the design-thinking process turns out to be particularly effective in analyzing and capitalizing on opportunities arising from digital innovation and converting them into valuable solutions for consumers (Magistretti, Pham, and Dell’Era 2021).

In facing the complexity of the system with its interconnected structure, design can rely on its intrinsic dynamic capabilities (Magistretti, Pham, and Dell’Era 2021) that include extending the knowledge base considering how digital innovation interacts with the whole context, debating and mediating

between the interests of internal and external stakeholders to achieve more robust insights, selecting the most meaningful data guiding innovation, interpreting the collected signals leading to the anticipation of future scenarios and, finally, recombining the obtained information and considerations to foster digital transformation.

Referring to these intrinsic specificities it is possible to sequence the process as a series of emblematic phases, namely researching, framing strategies, envisioning, and developing, all of which constitute the design-thinking approach. These steps lead to the creation of a structure that can generate value in an inclusive and transversal way for all the elements outlined within the scheme. The dynamism of the method offers a new reading of sustainable development starting from an imaginative space – in which different perspectives are incorporated to achieve an effective visualization of possible solutions – that can be tested and implemented (Buhl et al. 2019). The ability of this approach to read signals in their entirety of meanings makes it a particularly effective tool applicable to the evolving context of the triple transition.

As Figure 1 illustrates, the main forces for change can, in turn, be categorized into enablers and drivers of innovation. The enablers – cultural revolution and technological/digital innovation – describes the necessary and copious conditions fostering innovation, leading to product and process innovation, by intervening both in terms of products and services offered and proposed methodologies to maximize efficiency in goal fulfillment (Kahn 2018). The drivers – social transformation and environmental change – indicate its main supporting elements (Bashir, Naqshbandi, and Farooq 2020), leading to actual business-model innovation. Concerning the climate crisis, pressures coming from outside in terms of new laws and regulations are promoting a change in the business structure (Todeschini, Cortimiglia, and de Medeiros 2020). The transition to sustainable business models has also become manifest in terms of competitive advantage and in how companies generate value, considering the growing and burdening pressures on limited natural resources. The circular economy-oriented business-model innovation can be driven by the intention of “boosting resource efficiency and effectiveness (by narrowing or slowing energy and resource loops) and ultimately closing energy and resource flows by changing the way economic value and the interpretation of products are approached” (Pieroni, McAloone, and Pigosso 2019, 201). Geissdoerfer, Vladimirova, and Evans (2018) propose an alternative definition of sustainable business-model innovation that focuses mainly on

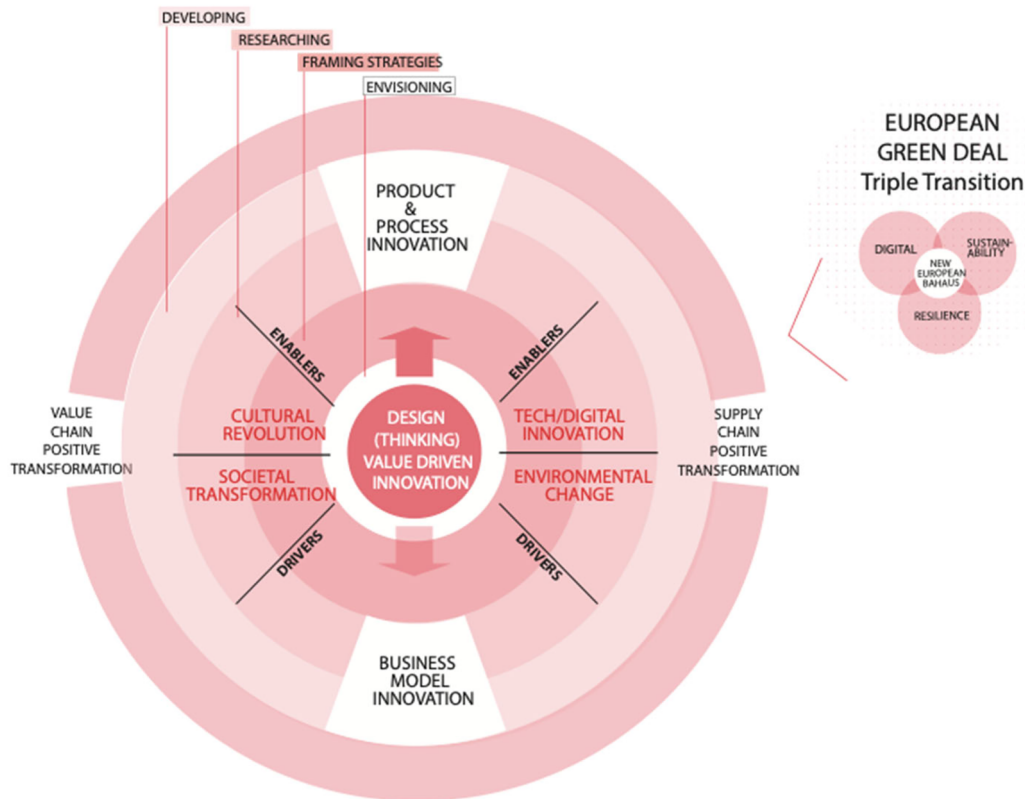


Figure 1. Triple transition through design.

the beneficial impact that sustainable development can have in terms of the value proposition and value creation toward society, environment, and the long-term organization of prosperity. Nonetheless, its main specificity within this context of profound change promoted by the current critical situation is to create and distribute value to customers, local communities, governments the natural environment, and society due to support provided by digital innovation (Biloslavo et al. 2020).

While environmental pressures can be a driver toward adopting more sustainable models, technological research provides concrete support for change. The development of new advanced equipment enables improvements in the production process, facilitating cost-cutting through improved alignment of production and market demand, thus employing the main use of information technology which enables agile data processing (Broccardo et al. 2023).

Figure 1 also provides an assessment of the impact of the four identified factors – cultural revolution, societal transformation, technological/digital innovation, and environmental change – by pairing the drivers with the enablers. Indeed, the cultural revolution and societal transformation intersect resulting in positive value-chain modification. The socio-cultural matrix resulting from the abovementioned intersection intervenes directly with the societal intangible value system. The impact of the current

climate crisis is operating promptly on the collective perception of the very climate crisis, creating a virtuous circle of mutual influences between the measures taken at the government level to limit the damage of the environmental emergency (for example the “European Green Deal”) and the orientation of consumer choices (Marsh et al. 2022).

Instead, the crossroad between technology-digital innovation and environmental change gives rise to a favorable change in the supply chain. The environmental change is pressing for structural renewal within the supply chain. A concrete answer to this urgent request comes from the technological evolution, which is operating for the digitalization of the supply chain, making sustainable solutions economically viable (Marsh et al. 2022).

The analysis of the scheme draws attention to how a reciprocal interdependence bond connects the value chain and the supply chain. In terms of the fashion sector and the models guiding the business, the figure shows that process and business innovation directly impact the value and supply chain, driven by the forces of change within the industry framework.

The immaterial shift in terms of meanings is grafted starting from the consumer’s demands within the supply chain. The latter, on the contrary, describes the tangible part on which it is possible to intervene concretely through instruments capable of reorganizing the business structure as a whole. In

support of this evidence, Casciani, Chkanikova, and Pal (2022) highlight how the digital transformation occurring within the fashion sector through the adoption of 3-dimensional virtual and digital (3DVD) technologies is reestablishing the customers' value chain and consequently creating new opportunities to foster a reconfiguration of the supply-chain system, thus operating on a general redefinition of the fashion-system structure.

In the proposed model, which examines how design can intervene within the context of the triple transition, it is necessary to explain the role of resilience within business dynamics. Its peculiar function is to protect the apparatus from shocks and stressors which may attack the business model. As a non-tangible expression of interactions, including the resilience component within the value model allows the simultaneous prevention of risks and the absorption and recovery of the danger possibly damaging the organization (Linkov et al. 2020). In addition to this analysis of the model, it is useful to highlight how nowadays design can be positioned at the heart of innovation. The characteristics of this methodology previously highlighted underline its ability to extricate within a complex system of references to identify a common trajectory that orients us toward a more sustainable future.

The perspective of design-driven innovation emerges as a vehicle to effectively tackle the challenges posed by the triple transition and allows action within the pillars of a holistic approach. In fact, design-driven innovation involves using design-thinking methodology (Cross 2011) to identify and analyze emerging cultural, social, and technological trends and drivers, and then applying these insights to develop new and improved products, services, systems, and processes that meet the evolving needs and desires of consumers.

The fashion industry thrives as a creative and cultural domain, where both tangible and intangible attributes of products, coupled with distinctive modes of production, jointly convey cultural and symbolic connotations to consumers (Bertola et al. 2016). Accordingly, a design-driven innovation perspective allows producers to capture changes in society by recognizing emergent patterns of cultural and technological advancement and to reframe political, economic, societal, environmental, legal, and ethical issues and to orient decisions toward possible solutions.

Innovation trajectories of fashion sustainability

This Special Issue on sustainable redesign of the global fashion system explores the organizational,

technological, and socio-cultural dimensions of transformation and is structured around three pivotal dimensions of action that contribute to the complexity of fashion sustainability.

First, fashion sustainability revolves around the essential realm of organizational change. This focus transcends business strategies and delves into profound reconfiguration of the very DNA of fashion entities. It encompasses the adoption of sustainable business models, the reevaluation of supply-chain practices, and the integration of ethical considerations into the core organizational ethos. This dimension entails a profound metamorphosis that signals a seismic shift from conventional practices to a holistic approach that harmonizes business aspirations with environmental and social responsibilities.

Second, this Special Issue devotes attention to the landscape of innovation within fashion products and processes and recognizes that sustainability is not merely an abstract concept but an actionable imperative that necessitates reimagining how fashion is conceived, designed, and manufactured. From the selection of eco-friendly materials to the implementation of energy-efficient production techniques, this dimension underscores the catalytic role of innovation in crafting a sustainable future for fashion. It also acknowledges the burgeoning potential of disruptive technologies in reshaping industry norms, creating cascading effects that extend far beyond the confines of design studios and factories.

Finally, we focus on the realm of socio-cultural transformations. This dimension recognizes that fashion is embedded within the stratified layers of culture and intertwines with social norms, values, and perceptions to influence consumption patterns and confronts questions of cultural appropriation, socio-economic disparities, and the role of fashion as a reflection of societal priorities. It grapples with the profound responsibility of preserving cultural heritage while simultaneously promoting ethical consumerism. This dimension concedes that fashion does not exist in a vacuum but is a mirror that reflects and shapes the world it inhabits.

Redesigning the fashion system: navigating organizational transformation

Exploration of fashion change traverses different organizational dimensions underpinned by the profound shift toward systemic transformation. Within this discourse lies a critical investigation into the effectiveness of organizational strategies and supply chain-management models that pave the way for an enduring metamorphosis toward sustainability.

Central to this analysis is inquiry into the viability of specific organizational strategies and supply chain-management paradigms as potent conduits for a much-needed transition to sustainability. In an era of heightened environmental consciousness, a pressing question emerges: To what extent do these strategies succeed in orchestrating a paradigm shift, dismantling conventional frameworks that fostered unsustainable practices? By scrutinizing evidence, this exploration aims to critically assess the potential of these strategies in steering the fashion industry away from its traditional trajectory, nurturing a system that is equitable, ethical, and ecologically responsible.

Moreover, the discourse delves into the growing emphasis on circularity and its pertinence within the global fashion ecosystem. The ascendancy of circular fashion is not merely a fleeting trend but rather a pivotal movement that underscores the industry's collective endeavor to mitigate environmental impact. To what extent does this circularity-centric approach permeate the complex web of the fashion industry's global operations? This section of the Special Issue seeks to dissect the concept of circularity, unveiling its potential to drive a shift from the linear "take-make-dispose" model to a regenerative, closed-loop paradigm.

The reshoring of production operations emerges as a compelling proposition in the realm of fashion-system transformation. As we scrutinize the footprints of globalization for their environmental and social ramifications, a critical lens is turned toward localized production. The exploration probes the potential implications of reshoring. Does it hold the promise of bolstering local economies, minimizing carbon footprints, and fostering a renewed sense of craftsmanship? By dissecting this phenomenon, the contributors to this section of the Special Issue contemplate the role that proximity and regionalization play in the larger sustainability equation.

At the core of this investigation is recognition that evolving business models and emerging best practices are intertwined with a robust understanding of sustainability imperatives. Business paradigms are no longer confined to the concept of profitability but are evolving into multifaceted constructs that meld economic viability with social responsibility and ecological stewardship. The articles comprising this section dissect the extent to which these business models are informed by a holistic comprehension of sustainability, emphasizing the pivotal role of ethical consciousness and environmental considerations.

The exploration delves into this organizational facet of the fashion industry, accentuating the role of strategies, supply chains, circularity, reshoring, and evolving business paradigms in fashion's systemic

transformation. Through a rigorous examination, the authors seek to shed light on the mechanisms that drive fashion's metamorphosis toward sustainability and contribute to shaping a fashion system that echoes the ideals of equity, ethics, and environmental stewardship.

In the first article in this section of the Special Issue, Miriam Bodenheimer, Johannes Schuler, and Thekla Wilkening, in their contribution titled "Drivers and barriers to fashion rental for everyday garments: an empirical analysis of a former fashion-rental company" scrutinize the online business-to-consumer (B2C) fashion-rental domain, drawing from an in-depth study of a former German fashion-rental firm. Focusing on everyday clothing rentals for both children and women, they employ a holistic approach merging business data, managerial insights, and customer surveys. By juxtaposing retailer and consumer perspectives, the authors identify challenges in the business models. The company's downfall was linked to deteriorating inventory quality and hurdles in acquiring and retaining customers. These obstacles underscore the need for targeted marketing, emphasizing high-end fashion, to heighten awareness and mitigate reservations about fashion rental. They discuss that integrating diverse data sources unveils the factors underpinning the success or failure of online-rental models.

The second contribution by Sophie Buchel, Aniek Hebinck, Mariangela Lavanga, and Derk Loorbach is "Disrupting the status quo: a sustainability transitions analysis of the fashion system." The authors conduct a multi-level analysis, grounded in collaborative research with the Laudes Foundation (formerly C&A Foundation), revealing the industry's entrenched state of disconnection, extraction, and disposability. They propose several strategic transition pathways to expedite the shift to sustainable fashion, acknowledging the urgency of system-wide change. This contribution is especially pertinent to the European Commission's 2020 Circular Economy Action Plan that prioritizes the textile industry and aims for a sustainable and circular strategy which is vital for necessitating innovation in design, technology, and practices.

Luca Coscieme and colleagues then introduce a framework to advance circular business models, exploring durability, access, collection, and recycling approaches. In their article titled "A framework of circular business models for fashion and textiles: the role of business-model, technical, and social innovation" they outline a framework focused on elucidating and advancing the proliferation of circular business models. It delves into four distinct approaches within the fashion and textiles domain: durability-based models, access models involving renting and sharing, garment

collection and resale, and recycling of materials. Within each model, the discourse covers facilitators encompassing technical and social innovations, policy changes, behavioral shifts, and educational initiatives. The proposed framework integrates these pivotal components, offering a systemic analysis tool for circular business models. It accentuates the need for policies orchestrating consumer-behavior shifts, promoting sustainable design, and instituting alterations in production methodologies.

Ermina D'Itria and Reet Aus next turn their attention in "Circular fashion: evolving practices in a changing industry" to considering how brands are transitioning from profit-driven to purpose-driven strategies, with the circular economy gaining prominence as a solution. However, current implementation of circular economy strategies faces challenges with respect to environmental, economic, social, and cultural sustainability. The article examines ongoing adoption of circular practices and their relevance globally, showcasing how design practices aid companies in holistic sustainability. The authors introduce a taxonomy of effective strategies, the so-called "mini-loops," that contributes to incremental advances toward a circular economy. Their study also envisions potential pathways for the fashion system to fully embrace circularity, addressing its current linear limitations.

This section of the Special Issue also includes a contribution developed within the context of a research project sponsored by the European Union which is an important stakeholder committed to supporting and driving sustainable changes in the fashion industry. The article by Jesse Marsh and colleagues is titled "A value-driven business ecosystem for industrial transformation: the case of the EU's H2020 'Textile and Clothing Business Labs'" and highlights the outcomes of their TCBL project that successfully established a network of textile and clothing-business labs. These labs aim to transform the environmentally and socially problematic textile industry through stakeholder engagement. This approach has fostered systemic shifts in business models, prioritizing knowledge, collaboration, and shared values over price competition.

Claudia Eckert, Philippa Crommentuijn-Marsh, and Sandy Black then tackle sustainability from the perspective of the UK in which the fashion industry represents a unique economic driver and as well a world-renowned cradle of creativity. Their article titled "The role of networks in supporting micro- and small-sized sustainable fashion businesses" examines the support systems that underpin micro- and small-sized sustainable fashion enterprises in the country. Drawing from investigations of 27 firms,

and including designers and product developers, their study illuminates formal and informal networks through actor-network theory. Supply-chain ties, professional networks, and chance personal and online contacts shape these networks. The article highlights the significance of trust and shared values, spotlighting how these networks drive sustainable practices and deepen designers' understanding of their craft. Geographical and cognitive proximity are explored in the context of informal networks.

In their article "Fashion in turmoil: impact of the COVID-19 pandemic on Finland's textile and fashion industry" Teresa Haukkala, Kirsi Niinimäki, and Linda Lisa Maria Turunen report on how, in the face of ongoing climate change, both consumers and fashion businesses are reevaluating their practices. The pandemic was a pivotal moment that deeply disputed the textile and fashion sector and shed light on its vulnerabilities. The study employs path-dependence theory to dissect the effects on the industry in Finland, revealing past shocks as transformational junctures. Historical analysis unveils the transformational effects of prior external events while empirical data from Finnish companies elucidates the pandemic's more recent impacts. Innovations emerged across design, manufacturing, sales, and marketing in response to the crisis, aligning with more sustainable practices, local production, and responsible business models. The authors also contemplate the post-pandemic prospects for the industry.

In a further contribution to this section of the Special Issue, Chiara Di Lodovico and Alessandro Manzi discuss the multifaceted nature of sustainability, exploring insights from five influential players in the cultural and creative industries. Their article titled "Navigating sustainability in the fashion industry: insights from entrepreneurial perspectives on collaborative approaches" highlights challenges, coping strategies, and other factors associated with the collaborative pursuit of sustainability and underscores the tension between the urgency of change and the industry's inherent complexity. They emphasize the pivotal role of networks along with the need for dialogue between innovative practices and regulatory frameworks.

This section on the organizational dimensions of sustainability transformation in the fashion industry concludes with Brief Reports outlining three sets of personal reflections. The first of these contributions by Francesca Romana Rinaldi, Claudia Di Bernardino, Virginia Cram-Martos, and Maria Teresa Pisani, titled "Enhancing traceability and transparency of sustainable value chains in garment and footwear," examines the impact of Recommendation No. 46 that was ratified by the United Nations Center for

Trade Facilitation and Electronic Business (UN/CEFACT) in April 2021. Developed under the United Nations Economic Commission for Europe (UNECE) in partnership with the International Trade Center (ITC) and the European Union, the document responds to how the COVID-19 pandemic exposed the weak and opaque value chains that characterize the production of garments and footwear. The report discusses how customer engagement, societal inclusiveness and traceability and transparency policies need to be leveraged to facilitate a sustainable transition of the global garment and footwear system, activating new alliances between industry and civil society. To support these points, the report also introduces the tools developed by UNECE to activate a circular and sustainable economy in the analyzed sectors.

The final two voices to contribute to this section are, respectively, Ezio Manzini and Kate Fletcher. Manzini describes in his Brief Report, “Fashion as diversity and care,” potential pathways for redefining fashion, reshaping its societal and cultural role in alignment with more sustainable paradigms and Fletcher, in a commentary titled “Perspectives: Earth rising” introduces the notion of “Earth Logic” as a novel approach that centers on Earth and its inhabitants, including humans, to rejuvenate fashion within planetary boundaries. This evolving fashion landscape encompasses current and emerging players, clothing, and organizational methods, adapted with revised principles to harmonize with this alternative view.

Innovating fashion products and processes: a design practice exploration

The focal point of this second section of the Special Issue lies at the nexus of innovation and technological metamorphosis within the domain of fashion products and processes. This thematic trajectory serves as an intellectual forum for contributions that traverse the uncharted territories of fashion’s evolution, interrogating the transformative dynamics that innovation and technology bestow upon this creative ecosystem. In adopting an academic lens, this exploration seeks to unmask the intricacies encapsulated within these intersections, thereby fostering a comprehensive understanding of their implications for sustainable paradigms.

Central to this academic pursuit is the interrogation of the most efficacious design methodologies, approaches, and practices that proactively kindle innovation within fashion’s realm. This analytical voyage endeavors to elucidate the mechanisms that render design a powerful agent of change, capable of steering the industry toward novel pathways of sustainable growth. Through a multidimensional

investigation, the contributors aim to unravel the interplay between creativity, functionality, and environmental stewardship – forging a harmonious synthesis that encapsulates both esthetic allure and ethical responsibility.

Intertwined with this discourse are pivotal inquiries into the role of design as a catalyst for sustainability within the expansive milieu of fashion. The lens turns toward the dynamics where design transcends esthetics to encompass ethical considerations and ecological consciousness. These treatments delve into how design creativity merges with its capacity to instigate change, becoming a vanguard that propels the industry’s transition from a linear to a regenerative framework.

Further enhancing the intellectual trajectory is the examination of a new generation of products and processes that emerge as harbingers of opportunities for pursuing sustainability. The section discusses state-of-the-art innovations, spotlighting their potential to recalibrate industry norms. These beacons of sustainable innovation provide insights into the nexus of form, function, and environmental responsibility, highlighting how their inherent design principles enable a harmonious merging of esthetics and ethics.

Venturing deeper into the exploration, the contributors redirect the focus toward emerging technological innovations that stand poised to serve as agents of sustainable system change. They dissect the intersection of technology and sustainability to unravel the latent potential of innovations that can fundamentally reshape the fashion landscape. The authors further explore the catalytic role that technological advancements play in transforming manufacturing, supply chains, and consumer behaviors, ultimately propelling the industry toward more regenerative trajectories.

Moreover, the realm of digital transformation influences the mitigation of the social and environmental impacts of fashion. This facet contemplates the catalytic potential of digital technologies in rendering the fashion ecosystem more transparent, accountable, and aligned with sustainable imperatives. It probes how the mechanisms of digitalization foster informed consumer choices and facilitate data-driven solutions, underscoring the synergy between technological innovation and ecological stewardship. This section unfolds across the diverse perspectives of innovation in fashion products and processes, traversing dimensions of design, sustainability, new generation products, technological innovation, and digital transformation.

Daria Casciani, Olga Chkanikova, and Rudrajeet Pal begin by offering an encompassing survey of the digital revolution within the fashion sector, highlighting its effects on supply chains, business models, and sustainability-focused advancements. Through desk research, the authors examine enterprises actively employing 3-dimensional virtual and digital technologies (3DVD), encompassing 3D modeling, virtual reality (VR), augmented reality (AR), two-dimensional (2D) and three-dimensional (3D) scanning, and digital twinning. Their article titled “Exploring the nature of digital transformation in the fashion industry: opportunities for supply chains, business models, and sustainability-oriented innovations” underscores the potential for digital tools to reshape conventional supply chains, mapping transformative shifts across processes, products, and services. Implementation of 3DVD by fashion entities unlocks avenues for product/service innovation, process optimization, and multifaceted business-model changes. Moreover, it reveals the interconnected impact of digital transformation on the four dimensions of sustainability, with cultural sustainability emerging as a pivotal concern. The 3DVD technologies catalyze shifts in design processes, consumer behavior, and corporate ethos, mirroring wider transformations in the industry’s structure.

In “Materials biography as a tool for designers’ exploration of bio-based and bio-fabricated materials for the sustainable fashion industry,” Valentina Rognoli, Bruna Petreca, Barbara Pollini, and Carmem Saito discuss how the fashion industry’s profound environmental impact has prompted growing recognition of the pressing need for sustainable transformation. Amid intensive research into alternatives, this article conducts an exhaustive analysis of these socio-environmental challenges. It investigates collaborative efforts among governments, industry, and designers to address the crisis and highlights a range of bio-based and bio-fabricated materials that could steer fashion toward sustainability. With 24 case studies categorizing novel materials by origin, five “materials-biography categories” emerge, aiding comprehension and communication. This taxonomy supports circular economy concepts, offering a material passport for enhanced communication, traceability, and user awareness. The concept of “materials biography” proposes a comprehensive framework for stakeholders to navigate this emergent landscape.

The final article in this section is by Elisabeth Eppinger and titled “Recycling technologies for enabling sustainability transitions of the fashion industry: status quo and avenues for increasing post-consumer waste recycling.” This work embraces the same

systemic approach as deployed earlier in the Special Issue by Casciani and colleagues and discusses the environmental toll of garment production, namely the surge in textile waste that underpins the urgency for sustainable shifts in the fashion sector. This study evaluates the viability of scaling recycling technologies in textiles, examining collection, sorting, and reuse processes. Findings from case studies and expert insights reveal existing impediments and prospects for technology diffusion. While promising initiatives abound, reconfiguring industry structures, designs, and models is essential. Critically evaluating the singular focus on recycled polyester, the article advocates for broader recovery and reuse improvements. Eppinger urges fashion brands and retailers to use their influence to drive sustainability norms in recycling.

Reshaping fashion cultures: exploring the socio-cultural dimension of fashion sustainability

As outlined in earlier sections of this article, a pivotal shift is underway in the realm of fashion, marked by a growing emphasis on sustainability. This paradigmatic transformation underscores the interplay between socio-cultural dynamics and the pursuit of fashion sustainability. This discourse aims to unravel the trends that serve as the bedrock for a more reflective consumer society that critically evaluates the prevailing models of mass consumption dictated by the fashion industry. A key query emerges: To what extent do these trends serve as the foundation for a conscientious consumer ethos that challenges the tenets of fashion-driven excess?

The contributions that comprise this section of the Special Issue describe the fabric of social practices and behaviors, as well as institutional adaptations, that act as conduits for promoting fashion sustainability. The authors raise pertinent questions about the viability of integrating eco-consciousness into the very nature of fashion-related practices, engendering a shift from ephemeral trends to enduring practices aligned with ecological and ethical considerations. The emergence of sustainable fashion initiatives necessitates meticulous examination of their potential to permeate the socio-cultural milieu, inducing transformative changes that transcend mere tokenism.

Central to the sustainability narrative is the false paradox of preserving the intrinsic cultural dimensions that define fashion while simultaneously fostering an awareness of the perils of cultural appropriation and commodification. The act of borrowing and integrating elements of cultural heritage within the realm of fashion is inherently intricate, often teetering between homage and exploitation. As such, probing the mechanisms that can effectively bridge

cultural appreciation and ethical sensitivity becomes indispensable. How can fashion serve as a conduit for cross-cultural dialogue while mitigating the risks of decontextualization and erasure?

Furthermore, this discourse posits a critical inquiry into strategies that catalyze sustainability-oriented innovation within the realm of fashion design. Amid the clamor for novel esthetics and cutting-edge trends, there lies a pivotal opportunity for designers to channel their creativity toward sustainable practices. As stakeholders supporting and promoting technological, esthetic, and meaning innovation, designers wield the power to redefine industry norms. Exploring the nuances of sustainable design processes, materials, and production techniques, this exploration aspires to unravel the potential for fashion to serve as an avenue for groundbreaking advancements, spearheading a shift toward harmonizing esthetics with ethics.

In essence, the transformative journey of fashion toward sustainability entails a negotiation between cultural heritage, ethical considerations, and innovative paradigms. The academic exploration of this first innovation trajectory seeks to unravel the complex tapestry of socio-cultural dynamics intertwined with fashion, offering insights into the trends, practices, and adaptations that can reshape the very contours of fashion cultures. Through a meticulous analysis of these intersections, this discourse aspires to contribute to a comprehensive understanding of fashion's potential as a catalyst for both cultural preservation and sustainable evolution.

In this regard, Sass Brown and Federica Vacca's reflections are rooted in the consideration that overhauling the fashion system demands a radical shift toward cultural sustainability and material preservation. Conversations around heritage preservation necessitate resurrecting ingrained cultural beliefs and meanings within traditional crafting. Local traditional craftsmanship is branded as a seemingly enduring cultural repository. Their article titled "Cultural sustainability in fashion: reflections on craft and sustainable development models" interprets evolved craft-based tactics in fashion to ostensibly drive positive, sustainable changes and disentangle from cultural appropriation. Selected case studies on fashion, design, and craftsmanship serve as the foundation for an interpretative model promoting cultural sustainability through traditional craft, emphasizing material practices and design's role in innovation. This speculative model centers on experimentation, innovation, and sustainability through a creative process guided by cultural heritage techniques, offering an array of potential outcomes that amplify innovative support for tradition while adhering to its entrenched norms.

The next contribution in this section by Otto von Busch, "What is to be sustained?" perpetuating systemic injustices through sustainable fashion," challenges us with a provocation, reflecting largely shared facts in regard of the specific model of fast fashion. The fashion system and academia seemingly concur that fast fashion lacks sustainability. The surge in consumption of affordable attire correlates with global extraction and pollution. Solutions proposed often shift blame to consumers, fostering an uneven dialogue. Sustainable consumption by the affluent is praised, contrasting with judgment on aspirational consumption of the less privileged. This article critiques how sustainability discourse perpetuates inequality and demeans lower social tiers. By invoking the French psychoanalyst and philosopher Felix Guattari's "three ecologies," von Busch highlights industrial emphasis, democratic erosion, and emotional degradation. He contends that these aspects mirror sumptuary laws, limiting societal progress. While unintended, shortsighted criticism of fast fashion curtails agency and accountability for sustainability, urging closer examination of its premises. However, these considerations seem to be valid for the fashion system in its entirety.

In fact, over the past three decades, concern for sustainability across wide sections of the fashion industry has grown. Despite acknowledging the need to address the social and environmental impacts of apparel production and consumption, consensus on the meaning of "sustainability" remains elusive. In the final contribution to this Special Issue, "Selling sustainability: investigating how Swedish fashion brands communicate sustainability to consumers" Taylor Brydges, Claudia Henninger, and Mary Hanlon highlight that definitions are context-dependent, making them subjective. The authors focus on brand-sustainability communication to consumers, examining the case of the Swedish fashion industry, which offers both the example of a fast-fashion colossus and the virtuosity of the northern European sustainable lifestyle. The authors illustrate how brands define sustainability diversely across websites, social media, and in-store campaigns. Given past greenwashing, defining industry sustainability is crucial, especially considering the initial and echoing impacts of the COVID-19 pandemic. The article emphasizes the necessity of setting and holding businesses to a solid sustainability standard for both theory and practice.

Conclusions

In summary, this Special Issue explores the multifaceted aspects of transforming the fashion system sustainably. It delves into three critical dimensions: organizational

change, product and process innovation, and socio-cultural transformation. The organizational aspect probes deep changes in fashion companies, blending sustainability with business strategies and ethical values. Product and process innovation emphasize tangible actions, from materials to energy-efficient techniques, triggering industry-wide shifts boosted with the use of digital technologies. Finally, the socio-cultural dimension explores fashion's link with society, addressing ethical consumption, cultural preservation, and the industry's influence on social norms.

Moreover, the Special Issue emphasizes the need for harmonized policy strategies that span entire fashion-value chains, advocating for the adoption of new consumption behaviors, innovative manufacturing and distributing models, and tailored solutions for sustainable fashion.

In this Special Issue, the exploration of fashion sustainability in its three critical dimensions highlights significant strides, yet equally underscores prevailing limitations within the industry's current applications and practices. The examination of organizational change extends beyond superficial business strategies, advocating for an intrinsic alteration in the operational DNA of fashion entities. This necessitates embracing sustainable business models, reevaluating supply chains, and embedding ethical considerations into the core ethos. However, these efforts, while substantial, unveil an arduous transformation that signifies a seismic shift but also exposes the vast chasm from conventional methods to a comprehensive approach aligning commercial aspirations with social and environmental duties.

In parallel, the focus on innovation acknowledges the essence of fashion sustainability as a tangible, actionable imperative. It emphasizes a rethinking of materials, endorsing eco-friendly alternatives, and revolutionizing production methodologies to be more energy efficient. Nonetheless, while this dimension spotlights the catalytic role of innovation, it also identifies the limitations of its widespread application, recognizing the necessity for broader implementation and more industry-wide engagement to foster more extensive change.

The socio-cultural dimension navigates the intrinsic links between fashion and societal norms, unveiling its influence on consumption patterns and societal reflections. It confronts critical quandaries such as cultural appropriation and socio-economic disparities, acknowledging the dual responsibility of preserving cultural heritage while concurrently advocating for ethical consumerism. Here, the dimension highlights the complexities and the industry's social influence, challenging the need for a more profound, more nuanced approach in understanding societal reflection and fashion's role in shaping societal ideals.

The current practices in the industry represent substantial progress, yet they inherently reflect significant gaps in achieving comprehensive sustainability. The need for further interdisciplinary research and collaboration across industry and civil society becomes evident to bridge these gaps. It is essential to penetrate deeper into the limitations within the existing practices and to push the boundaries further to integrate fashion's responsibilities more adeptly within societal and environmental paradigms. This comprehensive approach stands to leverage the synergies across these domains, addressing limitations, and steering the industry toward holistic sustainability. However, as we navigate the intricate landscape of transforming the fashion system sustainably, it becomes imperative to acknowledge and grapple with the inherent challenges and drawbacks elucidated by this Special Issue. The examined organizational changes, though advocating for intrinsic alterations in the operational DNA of fashion organizations, reveal the uphill battle of transitioning from conventional business models to those seamlessly blending commercial aspirations with heightened social and environmental duties. Similarly, while innovation in materials and production methodologies is underscored as a tangible imperative, the limitations in its widespread application underscore the need for more extensive industry-wide engagement and commitment to foster meaningful change. Furthermore, the socio-cultural dimension, while shedding light on the industry's influence on societal norms, also unearths the complex quandaries of cultural appropriation and socio-economic disparities, urging us to recognize the dual responsibility of preserving cultural heritage while concurrently advocating for ethical consumerism. Therefore, this expanded perspective not only accentuates the strides made in the pursuit of sustainable fashion but prompts us to confront the considerable gaps and challenges, urging further interdisciplinary research and collaboration to propel the industry beyond its current limitations and into a more comprehensive and truly sustainable future.

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