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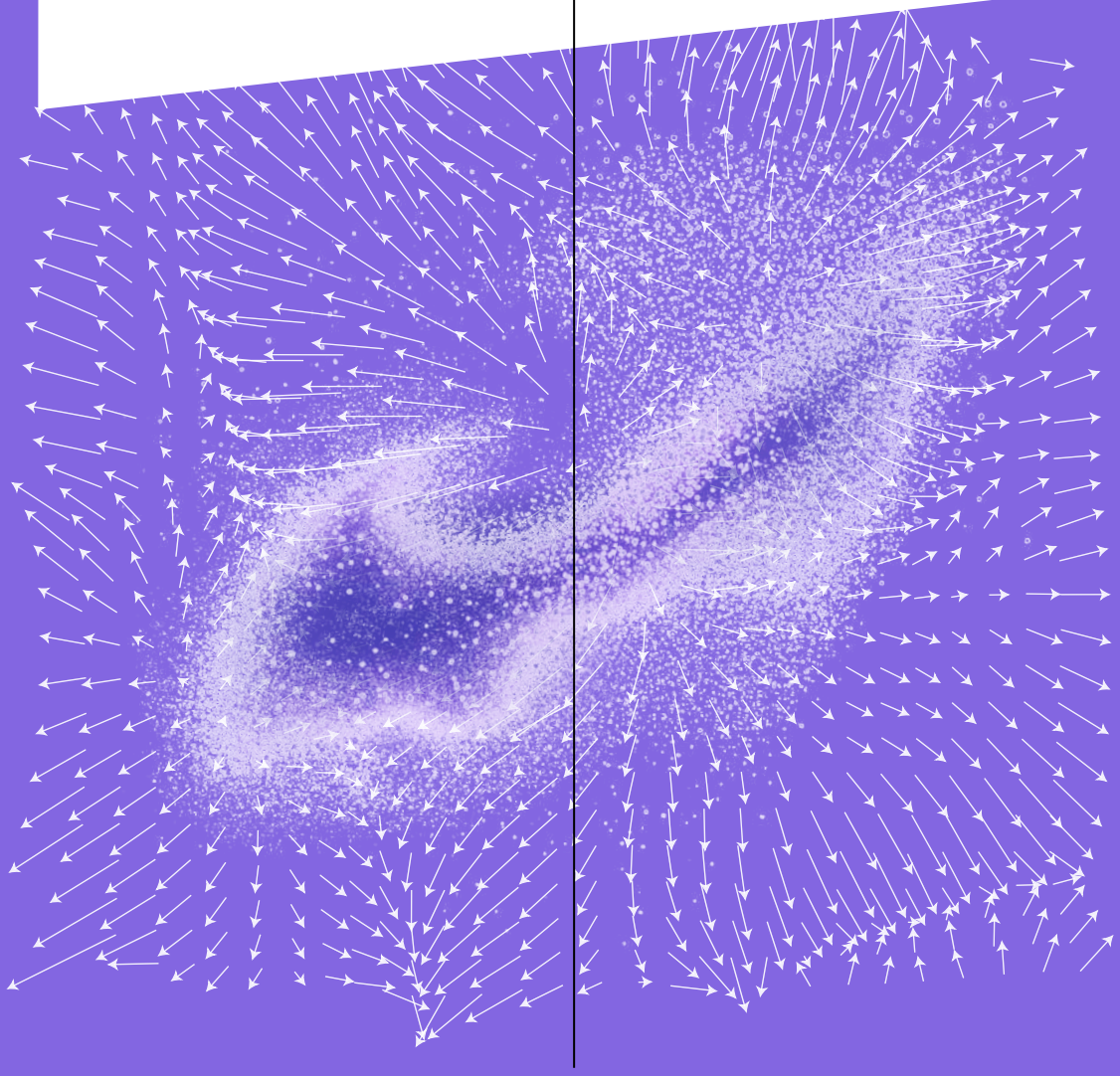

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CONTENTS

DIMENSIONS OF TRANSITION

GROUNDING PRACTICES

EDITORIAL

RESHAPING FROM WITHIN:

ITALIAN FASHION AT THE INTERSECTION OF HERITAGE, CIRCULARITY AND DIGITAL TRANSFORMATION

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Abstract

The special issue *RHITA. Reshaping Italian Fashion* gathers reflections, contributions and research outcomes from the PRIN 2022 PNRR project *RHITA. ResHaping made in ITAly*, which investigates circular and digital transitions for Italian fashion heritage and manufacturing through a consortium of five fashion design research universities: University of Campania "Luigi Vanvitelli", Politecnico di Milano, University of Florence, IUAV University of Venice, and University of Siena.
Italian fashion operates today at the intersection of two interconnected transitions, circular and digital, that must be negotiated without sacrificing the territorial specificity, distributed knowledge, and craftsmanship excellence that define Made in Italy. RHITA frames these transitions not as external pressures to comply with, but as an opportunity for an endogenous process of reshaping in which design mediates heterogeneous forms of productive, relational, cultural and digital knowledge, turning fragmentation into a systemic resource. The project is structured around three interconnected priorities: the valorisation of human capital and collective intelligence; the affirmation of cultural and productive identity through recognition of local differences; and the implementation of circular and inclusive models through digitally-mediated stakeholder collaboration. The methodological approach is grounded in a design-driven perspective, combining cross-disciplinary convergence, participatory co-design, and a dialogic model of cooperation.

Keywords: *Made in Italy, Circular Fashion, Digital Inclusivity, Territorial Knowledge, Design-driven Innovation.*

Fashion is one of the cultural and productive systems through which contemporary societies articulate identity, meanings and consumption practices. As a complex system, fashion intersects aesthetic, economic, symbolic and material dimensions, operating simultaneously as a visual language, a device for identity construction, an industrial sector and a social phenomenon (Kawamura, 2008). In the Italian context, this multidimensionality takes on particular connotations, as fashion is not only a manufacturing industry, but also a cultural heritage layered over time (Mora, 2010), an expression of craftsmanship handed down through generations, and a testament to the deep relationships between territories, communities, and production practices. It is in this perspective that Made in Italy transcends the purely productive dimension to become a collective narrative, a condensation of stories, places and skills that are embodied in material objects and the processes that generate them.
The ecological and digital transition of the fashion sector is now one of the most complex and urgent challenges for European production systems, raising not only technical and regulatory issues, but also the very possibility of preserving and reactivating this cultural heritage in ways that are compatible with the new imperatives of environmental sustainability and social responsibility (Niinimäki et al., 2020; Peters et al., 2021). While the European Union is introducing

a stringent regulatory framework - from the Strategy for Sustainable and Circular Textiles to the Regulation on Eco-design for Sustainable Products (ESPR) (European Commission, 2020) – which imposes requirements for eco-design, durability, extended producer responsibility and traceability, on the other hand, national production systems are called upon to find their own ways of responding to these transformations, capable of combining regulatory compliance with the preservation of the cultural and manufacturing specificities that constitute their distinctive value. At the same time, the acceleration of digital technologies – from collaborative platforms to blockchain traceability systems, from artificial intelligence to phygital solutions that integrate physical and digital dimensions – opens up unprecedented opportunities to rethink organisational models, supply chain logic and forms of coordination between actors distributed throughout the territory. However, the adoption of these technologies in the context of the Italian fashion system requires digital inclusivity strategies that reduce barriers to access and encourage local appropriation, capable of enhancing local knowledge.

In this scenario, the Italian case presents unique characteristics that make it a particularly significant laboratory for observing how sustainable and digital transition can be articulated in fragmented, territorially rooted production contexts based on distributed knowledge rather than large industrial concentrations. Roberto Camagni's framework of territorial capital is particularly illuminating here: each territory combines productive, cognitive, relational, social, human and environmental assets into a distinctive configuration (Camagni, 2009), and design can function as a mediating agent capable of activating and recombining these heterogeneous forms of capital towards sustainable innovation trajectories. The very characteristics that have historically determined its success, including the concentration of specialised skills in territorial districts (Brun & Castelli, 2008; Rinallo & Golfetto, 2006), the prevalence of small and medium-sized enterprises, and the integration of craftsmanship excellence and design innovation (Aage & Belussi, 2011), now present an ambivalent situation in the face of sustainability challenges: on the one hand, they represent valuable cultural and operational resources for building alternative models of development; on the other, they require forms of innovation that are capable of responding to the specificities of the system (Tebaldi et al., 2022; Colucci & Vecchi, 2021).

In this complex transition scenario, the special issue *RHITA. Reshaping Italian Fashion* stems from the activities of the national research project PRIN 2022 PNRR *RHITA. ResHaping made in ITAly. Circular models for Italian fashion heritage and manufactures through digital inclusivity and conscious innovation*, funded by the Ministry of University and Research as part of the National Recovery and Resilience Plan. The project has consolidated a national network of five universities (University of Campania "Luigi Vanvitelli", Politecnico di Milano, University of Florence, IUAV University of Venice, and University of Siena) spread across four regions (Campania, Lombardy, Tuscany, Veneto), representing four cultural and productive landscapes of Italian fashion. The rationale for this multi-regional configuration is not merely logistical: as Vandana Shiva argues, the disappearance of diversity eliminates alternatives, while transitioning to diversity as a mode of thinking and acting liberates a multiplicity of choices (Shiva, 1995). Applied to the Italian fashion context, this principle suggests that the resilience and innovative potential of Made in Italy reside precisely in its plurality of productive cultures – and that any transition model must preserve rather than flatten these differences. This territorial configuration reflects the distributed and specialised nature of the Italian fashion system: each region represents a distinct productive ecosystem, characterised by localised knowledge and skills ranging from the textile and tanning districts of Tuscany to the excellence of Como silk, from the sartorial tradition of Campania to the Venetian production of knitwear, leather goods and accessories. Yet this geography is not static. Drawing on Deleuze and Guattari's concept of re-territorialisation (Deleuze & Guattari, 1980), Italian fashion territories can be understood as spaces of mobility and relational tension rather than fixed containers of local identity: the technological and sustainability-driven transformations currently underway are simultaneously dissolving established district boundaries and generating new forms of trans-territorial aggregation, in which proximity is redefined around shared values, practices and innovation agendas rather than mere geographical contiguity. RHITA positions itself precisely within

this re-territorialising dynamic, building a network that does not flatten regional specificities but reconfigures their relations through collaborative, digitally-mediated forms of knowledge exchange. RHITA starts from the fundamental recognition that this dual transition (sustainable and digital) must emerge from a process of reshaping (redefinition, remodelling) that brings together cultural heritage, territorial knowledge, technological innovation and new forms of collaborative governance, taking the form of an endogenous process capable of enhancing the specificities of the Italian production system while orienting it towards environmental and social sustainability objectives. In this sense, the project investigated how the Italian fashion system is finding its own autonomous way to reorient itself towards more sustainable and circular models, focusing in particular on forms of innovation capable of redesigning organisational configurations, business models and production processes without sacrificing the cultural identity and manufacturing quality that constitute the distinctive core of Made in Italy. The very notion of reshaping as an endogenous and culturally grounded process of transition finds its most developed articulation in research that frames the competitive distinctiveness of Made in Italy not as a static inheritance but as a living system of values (Ranzo & Scarpitti, 2020), practices and productive intelligence to be actively renewed (Morace & Santoro, 2014).

RHITA's strategic objectives are structured around three interconnected priorities: enhancing human capital by strengthening collective intelligence as a driver of conscious innovation; affirming Italian cultural and productive identity by recognising differences and the heritage of local cultures and strengthening the manufacturing and production system in relation to the configuration of a new fashion value chain; implementing the Italian circular fashion system model through structured processes of awareness building and integration among stakeholders and the dissemination of inclusive digital operating models.

To achieve these objectives, RHITA has adopted a methodological approach rooted in a design-driven perspective shared by all the research units involved and nourished by theoretical-applied approaches and research methodologies specifically adopted by each unit according to its own characteristics and expertise. By its very nature, the design-driven approach promotes sustainable and inclusive innovation, adopting a human-centred perspective that harnesses the potential of technology to introduce meaningful, culturally and socially responsible innovations (Ceschin & Gaziulusoy, 2016). This approach is based on three main pillars: the cross- and inter-disciplinary dimension, capable of bringing together humanistic, technological and design components by sharing a common language and shaping open and dialogical operational tools; the participatory and collaborative nature, which enables co-creation processes among all project participants to respond to the diverse needs of stakeholders; the ability to inform and visualise interpretative frameworks and operational models capable of guiding design strategies and actions, materialising new knowledge and directing innovation towards shared and inclusive solutions. The collaborative model underpinning RHITA finds a pertinent theoretical reference in Richard Sennett's notion of dialogic cooperation, which distinguishes between dialectic – a mode that risks erasing difference in its drive towards synthesis – and dialogue, which instead makes differences available for interpretation and shared understanding (Sennett, 2012). This distinction is operative in RHITA's methodology: the project does not seek to impose a unified vision across its five research units, but rather to establish a dialogic space in which complementary competences, distinct territorial roots and divergent research trajectories are brought into productive relation without being reduced to a common denominator.

The project was divided into three interconnected phases. "Shaping Fashion Made in Italy" conducted a critical review of the Italian fashion system as a multifaceted network of industries, territories and creative practices. Through three complementary mappings dedicated respectively to identity and values (museums, archives, institutions that preserve heritage), education (universities and schools that train future professionals in the sector in the four regions), and manufacturing (companies, industrial districts and supply chains that constitute the productive backbone, from clothing to accessories, from textiles to leather goods), this phase has provided a detailed picture of the contemporary Italian fashion landscape, connecting historical heritage and contemporary

values. "Reshaping Fashion Made in Italy" gathered the voices of companies, artisans and innovators through interviews that offer a living portrait of how Italian fashion is evolving, organised into thematic areas that reflect the transformations taking place (from material innovation to regulatory changes, from waste-to-value practices to new collaborative models) and connected to the three guiding dimensions of the project (circular, phygital, education), tracing a constellation of perspectives on how the Italian fashion system is imagining its future. "RHITA projects" embodied a co-design approach in which researchers, SMEs, designers and local communities collaborated to test innovative ideas through territorial pilots, translating heritage and design and manufacturing know-how into experimental practices that connect design and technology to imagine sustainable futures for Italian fashion. Across the three phases, the project developed and implemented a Web 3.0 digital platform, conceived as a collaborative ecosystem for networking, communication and dissemination of regional fashion supply chains, based on the principles of awareness, circularity and inclusiveness. The platform is configured as a "digital dialogue space" in which to reformulate the connections between institutions, training and local actors in the supply chain, investigating and enhancing the cultural and productive landscape of Italian fashion.
The contributions collected in this special issue present the results of these research activities, offering a comprehensive overview of the transformations taking place in the Italian fashion system and proposing project directions for a transition that is at once ecologically responsible, economically sustainable and culturally rooted in the specific characteristics of Made in Italy. The structure of the issue reflects the conceptual and methodological architecture of the project, divided into sections that progressively lead the reader from the theoretical-philosophical and systemic framework to concrete territorial practices, passing through the exploration of the environmental, social and productive dimensions of the transition underway.

SETTING THE STAGE. MATERIALITY, SYSTEMS, AND DIGITAL FASHION ECOSYSTEMS

The opening section of this special issue, *Setting the Stage. Materiality, systems, and digital fashion ecosystems*, lays the theoretical, systemic and operational foundations for the entire special issue. The three contributions that comprise it offer complementary interpretations (philosophical-theoretical, systemic-design, and technological-infrastructural) to frame the complexity of the transition underway in the Italian fashion system, thus articulating the conceptual framework and operational tools through which the subsequent contributions can be read and brought into dialogue.

Chiara Scarpitti's contribution opens the volume with a radical theoretical framework: reading the RHITA project as a laboratory for rethinking the fashion system through the paradigm of expanded materiality. Drawing on Spinoza's materialism and Karen Barad's agential realism, the author proposes an intra-active vision in which matter, bodies, technologies and territories emerge as co-constituted and relational phenomena. Digital technology is conceived as a technology of material densification; sustainability as systemic productive friction, a critical device capable of making interdependencies and limits visible. The contribution closes with a ten-point manifesto that guides the reading of the subsequent contributions.

Alessandra Spagnoli addresses one of the constitutive tensions of the Italian fashion system, placing the structural condition of fragmentation (industrial districts, SMEs, localised knowledge and relational governance) in relation to the systemic needs of the circular transition. The contribution argues that circularity is not a technical-technological challenge, but an organisational and cultural problem, requiring the simultaneous design of coordination infrastructures, shared meanings and hybrid processes. Fragmentation thus ceases to be seen as a constraint and emerges as a productive condition from which new forms of horizontal coordination can arise.

The third contribution, by **Michela Carlomagno, Francesco Izzo and Rosanna Veneziano**, completes the framework of the special issue by presenting the RHITA digital platform as a socio-technical ecosystem for knowledge sharing among actors in the fashion supply chain. Through a comparative analysis of case studies, the paper identifies recurring patterns and design opportunities, laying the foundations for the

definition of pre-design requirements for accessible, low-tech and environmentally responsible platforms.

ROOTS & REACTIVATION. FASHION HERITAGE AND TERRITORIAL IDENTITIES AS A FOUNDATION FOR RESHAPING

The first thematic section, *Roots & Reactivation. Fashion heritage and territorial identities as a foundation for reshaping*, brings together three contributions that examine the cultural heritage of Italian fashion as an active epistemic resource, investigating its potential to guide the transformation processes of the contemporary production system.

Ornella Cirillo e Anna Chiara Bonanno present the results of a systematic mapping of fashion heritage in Campania, examining archives and museums in their function as territorial cultural infrastructures. Through the adoption of a critical framework of analysis, the research highlights the strengths and weaknesses of regional heritage systems in relation to the transformations underway, providing an overview of the specific features that distinguish Campania's heritage within the broader national landscape and identifying trajectories for its critical and contemporary enhancement.

Gabriele Monti addresses the theme of Made in Italy archives by developing operational definitions and mapping actions. The contribution argues that fashion archives are not mere repositories of historical memory, but active agents in contemporary design practice: exhibitions and curatorial projects become devices for reactivating historical knowledge, making it operational for present and future innovation processes.

The section concludes with **Alessandra Varisco**, who proposes a definition of design and production heritage through the case study of the workshop *Disegni, Illustrazioni, e Cartamodelli* (Drawings, Illustrations, and Paper Patterns). The contribution demonstrates how the use of phygital practices for the reactivation of historical sources of fashion manufacturing can constitute a methodological device capable of mediating between heritage documentation and contemporary production knowledge in the context of the reshaping of the Italian fashion system.

DIMENSIONS OF TRANSITION. ENVIRONMENTAL, SOCIAL AND SYSTEMIC FASHION TRANSFORMATIONS

The second section, *Dimensions of Transition. Environmental, social and systemic fashion transformations*, brings together three contributions that explore the environmental, productive and social dimensions through which the Italian fashion system is undergoing a structural transformation. The three studies critically examine the conditions of possibility for transition, highlighting both the opportunities and vulnerabilities that characterise the Italian production ecosystem in the face of new sustainability requirements.

The contribution by **Andrea Quartu, Paolo Franzo and Elisabetta Cianfanelli** examines the transformations underway in the Italian fashion system, questioning the contemporary conditions under which Made in Italy can be reproduced and reformulated. Through the analysis of circular practices, phygital approaches to fashion and informal education initiatives, the paper provides a detailed map of the paths of transformation that are reshaping the territorial and productive identities of Italian fashion.

Margherita Tufarelli introduces the perspective of waste ecologies to interpret the ecological transition of Italian fashion manufacturing. Pre- and post-consumer waste streams, long neglected or treated as residues, become strategic sites for innovation, while revealing structural vulnerabilities and unprecedented opportunities in specialised Italian industrial districts. The contribution proposes circular pathways to orient manufacturing systems towards regenerative models.

The contribution by **Annamaria Recupero, Giuseppe De Filco and Patrizia Marti** introduces the social component into the debate on sustainability, recognising it as a constitutive and not an accessory part of sustainable fashion. The article examines the relationship between fashion, disability and bodily diversity, proposing inclusive design approaches capable of overcoming normative bodily standards, orienting the system towards authentic forms of social responsibility and design inclusion.

GROUNDING PRACTICES. SUPPLY CHAINS, MANUFACTURING, AND CIRCULAR FASHION

The third section, *Grounding Practices. Supply chains, manufacturing, and circular fashion applications*, grounds the theoretical and systemic reflections of the previous sections in the concrete reality of practices, supply chains and case studies located in the territories of Made in Italy. The four contributions that comprise it document practical experiences that translate the issues of circularity, territorial regeneration and sustainable consumption into operational devices, collaboration models and intervention protocols.

Edoardo Brunello analyses the tanning and leather goods supply chain, a strategic sector for Made in Italy and fundamental to the economies of the territories involved in RHITA, as an exemplary case of how territorial systems negotiate global pressures while maintaining their local specificity. The international competitiveness of the Italian fashion system increasingly depends on its ability to integrate production specialisation, sustainable innovation and shared cultural values, and universities are emerging as a privileged space for mediating between distributed creativity and responsible production practices.

Roberto Liberti and Luigi Chierchia present Yamamay Reloaded, a project that integrates upcycling practices on unsold fast fashion garments with principles of sustainable development. Developed through collaboration between universities, social enterprises (Prism S.r.l.) and brands (Yamamay), the case study demonstrates how value co-creation models can generate social, environmental and economic impact, while addressing the challenges of textile waste in Italian fashion supply chains.

Entering the Wellness Textile sector, **Maria Antonietta Sbordone and Ilenia Amato** propose Adaptive Doing as an operational strategy for the regeneration of production systems. Conceived as a dynamic and situated design paradigm, the approach integrates adaptive processes and experimental practices oriented towards sustainability, well-being and territorial resilience, demonstrating how the enhancement of local resources and traditional knowledge can drive material innovation.

The section concludes with a contribution by **Gabriela Fabro Cardoso and Valeria M. Iannilli**, which explores how fashion consumers interpret sustainability today, highlighting the gap between stated intentions and actual purchasing behaviour. Through participatory workshops based on scenarios, narratives and visual tools, the research reconstructs the attitudes, motivations and obstacles that influence everyday choices, proposing co-design approaches to bridge the intention-action gap in sustainable fashion consumption.

A SHARED LEXICON

The volume concludes with *A Shared Lexicon*, a section that distils and establishes the language that emerged from the entire RHITA project. The glossary, edited by **Raffaele La Marca, Annarita Bianco and Michela Musto**, provides conceptual tools for navigating the future of fashion ecosystems, systematising the key terminology that emerged from the research and building a shared vocabulary for understanding design innovation, value chains, knowledge infrastructures and digital systems across the sector. The lexicon is configured as a device that enables dialogue between different actors, disciplines and operational scales, establishing a common syntax for the transformation of the fashion system.

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SETTING THE STAGE

MATERIALITY, SYSTEMS, AND DIGITAL FASHION ECOSYSTEMS

EXPANDED MATERIALITY IN THE RHITA ECOSYSTEM:

TOWARDS A MANIFESTO FOR INTRA-ACTIVE FASHION

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Abstract

This paper analyses the RHITA (ResHaping made in ITAly) project, presenting it as both a theoretical and operational laboratory for structurally rethinking the fashion system through the paradigm of expanded materiality. Drawing on Spinoza's immanentist materialism and Barad's agential realism, the essay describes fashion as an interactive system in which matter, bodies, technologies, and territories are interconnected and constantly evolving. In this perspective, the fashion product is no longer a stable object but a temporary assemblage of heterogeneous forces and dimensions, both physical and digital.
The visual identity of the RHITA project is based on broader reflections arising from two phenomena observable in quantum physics – the entanglement and the gravitational field - used as metaphors for the ability to attract and connect elements that appear distant or unrelated. Digital technologies are not understood as tools of dematerialisation, but rather as devices that enrich matter by multiplying its levels of existence. Sustainability, instead, is reinterpreted not only as a necessary condition for the project's existence and for optimizing a drifting system, but also as a form of systemic friction.
The paper concludes with a draft manifesto of ten principles proposing an intra-active fashion approach oriented toward ecological co-responsibility, co-evolution with the digital realm, and the construction of sustainable plural futures.

Keywords: *Fashion Theory, Fashion Practices, Neomaterialism, Digital Technologies, Intra-action*

THE GENERATIVE THEORETICAL PREMISES OF THE RHITA PROJECT

Every technological advance produces a change in perspective and transforms the cognitive models through which we perceive and interact with reality. The introduction of a new technology implies a different way of organising the project and translating it into operational knowledge. (Marotta & Scarpitti, 2025). Starting from this, technology is configured as an enabling process where design is a reflection of these changes.
In the case of the fashion system, in particular, the project not only reproduces these changes, actively participating in their constitution, but also becomes a tool that amplifies, experiments with and mixes them through new systems of invention, generating continuous hybridisations and further developments. The *RHITA Reshaping Made in Italy* project is structured within this constantly evolving framework, with the aim of creating a collaborative network between five Italian public universities (the University of Campania 'Luigi Vanvitelli', the Polytechnic University of Milan, the IUAV University of Venice, the University of Florence and the University of Siena), which have been involved in fashion for over a decade.

The very title of the project, '*Reshaping Made in Italy*', indicates a clear desire to reshape the sector's evolutionary trajectory, intertwining multiple dimensions: historical, productive and environmental. The subtitle, '*Circular models for Italian fashion heritage and manufactures through digital inclusivity and conscious innovation*', refers

to the design of innovative and inclusive circular models that bring together both fashion's cultural heritage and new technologies. In a co-evolutionary perspective between sustainable technologies and processes, the *RHITA (ResHaping made in ITAly)* project aims to build a creative ecosystem geared towards the digital and sustainable transition of fashion in Italy.

The project is structured around several key actions, such as mapping the Italian fashion landscape, experimenting with innovative design practices, remodelling manufacturing in a green and tech-oriented way and, finally, designing a Web 3.0 platform capable of strengthening and disseminating the established network.
RHITA's reimagining of Made in Italy adopts a co-participatory and transdisciplinary methodology, visualising the fashion system as a physical space defined by co-agents, forces and attractors, which act through continuous flows and dialogical practices (Glissant, 2019). This operational imagery forms the basis for both the visual image of the project and the idea of a fashion system understood as a relational field of attractive forces and material, informational and symbolic flows.

The fashion-oriented product, in fact, does not coincide only with the final object or artefact, closed in on itself, but with a continuous and rhizomatic process (Deleuze & Guattari, 1980/2006) that includes origin, transformation, use, disposal and possible regeneration. Starting from this vision of concatenations (De Landa, 2006), the *RHITA* project has become a privileged opportunity for experimentation to activate circular and conscious models and unexpected and intertwined manufacturing processes.
Broadening the horizon of contemporary design, if in the 21st century design has ceased to be a problem-solving practice, limited to form and function, the new century also and above all defines design as a practice of sense-making (Manzini, 2015) and world-making (Escobar, 2018).
In light of these theoretical references, *RHITA* aims to establish itself as a creative ecosystem capable of critically questioning fashion production regimes: the goal is to challenge the industry's degenerative processes and, at the same time, explore alternative design practices that promote more ethical, responsible and regenerative models (Kothari et al., 2021). In this sense, the project is an opportunity to reflect on the broader processes of technological and cultural transformation that are redefining the contemporary fashion system, contributing to the construction of possible worlds and alternative models of relationship between manufacturing, the environment and society.
Based on the above-described objectives relating to the project's fashion practices, the neomaterialist condition appears to be the most relevant theoretical premise for the establishment of a new way of thinking about and making fashion. This is because fashion is a condensation of the tangible and intangible dimensions and is 'clothes free' (Ranzo & Scarpitti, 2020), insofar as immateriality is condensed into matter and vice versa (Fiorani, 2006).

This contribution aims to demonstrate how the RHITA project, in its development, does not implement a simple incremental innovation of the fashion contemporary system, but rather a structural rethinking of it, based on an idea of expanded materiality: a condition in which the tangible and the intangible, the physical and the digital, the organic and the computational cease to be separate domains and become fields of intra-action. (Barad, 2007).

THE EXPANDED MATERIALITY OF FASHION, TOWARDS AN AGENTIAL REALISM

To clarify the meaning of expanded material culture, this paragraph explores the role of matter in fashion from two fundamental theoretical positions:

- matter as a vital and unitary principle beyond the dualism between active and passive matter;
- the neo-materialist perspective as a strategic approach to project ecology.

Through the set of reflections and practices that the RHITA project has implemented, it is possible to glimpse a concept of expanded materiality which, from a theoretical point of view, starts from Baruch Spinoza's immanentist materialism and arrives at Karen Barad's agential realism.
In Spinoza, reality is conceived as a single infinite substance in which mind and body are not two separate entities, but two attributes of the same ontological reality. This monism dissolves Cartesian dualism and opens up an understanding of matter as a dynamic, relational process, continuously traversed by regenerative flows. According to a relational and non-substantialist conception of existence, every entity, whether living or non-living, human or non-human, is defined by its capacity to affect and be affected (Spinoza, 1677/1996), that is,

to act on or be acted upon by others.
In the current context, Spinoza's vision seems to anticipate the intertwining of contemporary philosophical currents such as post-anthropocentrism (Ferrando, 2016), neomaterialism (Braidotti, 2019) and agential realism (Barad, 2007), opening up matter to new perspectives and manipulations, towards a more conscious ecological transformation.

On the one hand, therefore, the refocusing of matter, understood as an indissoluble and at the same time plural entity, affirms how human and non-human agents (Jaque et al, 2019) reverberate within objects and processes, assuming the role of active and participating presences (Bennett, 2010). On the other hand, a vision of matter conceived as energy, corpuscular life, vibrations and interrelationships emerges, which is perfectly consistent with the latest theories of quantum physics.
If we apply these considerations on materiality to the contemporary fashion industry, every artefact or design practice interacts with multiple factors that contribute to its final configuration, in dialogue with the surrounding environment. These agents, in turn, are absorbed and contribute to the continuous exchange between energies, vibrant materiality and changes of state. Through a relational view of physical reality (Rovelli, 2014), the organic-artificial and physical-digital dualities are overcome by a multidimensional conception of matter that transcends traditional dichotomies.
In relation to this, Barad's agential realism radicalises this position of relationality and replaces the concept of simple inter-action with that of intra-action (Barad, 2007): if inter-action presupposes pre-established entities that enter into a relationship, intra-action implies that entities emerge and are constituted through the relationship itself.

Basing her argument on the principles of mechanical physics, Barad teaches us that matter should not be understood as a 'thing' but as a 'doing', a process of condensation of agency. If we project this concept onto the materiality of fashion design, we see that actors, forces, technologies and materials at a distance constitute and consolidate themselves with each other as phenomena in the making. In short, Barad proposes 'a relational ontology (...) for the production of material bodies' (Barad, 2003/2017), which lends itself well to the fashion-oriented sector and, more generally, to design-oriented creative ecosystems.

The continuous material reconfigurations – visible in the RHITA project, and also more generally in the world of fashion – are therefore the effect of the continuous intra-actions that emerge from the encounter between different agents. From this, we could say that the project is no longer an imposition of a human form on a non-human materiality, but rather an encounter halfway between the two.
The transition from an idea of inter-action to an idea of intra-action is a substantial point, and is also supported by some practices activated by the RHITA project and illustrated at the end of the paragraph.
Starting from Spinozian thought, then moving through neo-materialism, and finally arriving at Barad's theory of agential realism, fashion design can be rethought as an immanent field of forces, in which bodies, processes, geographies, substances and technologies relate to each other, structuring themselves as they are made. On a concrete level, therefore, designers, production infrastructures, places, materials and digital technologies do not exist on separate levels, but take on meaning through unstable, constantly changing assemblages.
In line with Rosi Braidotti's post-anthropocentric thinking, the affirmative politics developed by the RHITA project 'combines criticism and creativity in the search for alternative images and projects' (Braidotti, 2014) and 'collectives aimed at affirming (...) hope, rooted in the ordinary micro-practices of everyday life, as strategies for organising, supporting and documenting sustainable transformations' (Braidotti, 2014).

The adoption of a neo-materialist and intra-active perspective, therefore, becomes strategic in steering fashion design towards a deeper ecological co-responsibility for what it imagines and produces. The non-separation between natural and artificial ecosystems, recognising that any substance has a vital principle, capable of acting and allowing itself to be acted upon, leads us to a different perception of the materiality of which a project is made (Ranzo & Scarpitti, 2023).
In relation to the manufacturing symbiosis processes supported by the RHITA ecosystem, for example, post-consumer residues, traditionally considered waste, are reintegrated as innovative resources for uninterrupted cyclicality. The material, therefore, continues to be important even beyond the end of the product's life cycle, metamorphosing into other production cycles for different uses.
The application of agency realism to fashion requires a post-anthropocentric view, insofar as

humans are not the sole creators, but co-agents alongside other entities, both organic and artificial, human and non-human (Ranzo & Scarpitti, 2024). Exploring the materiality of fashion from this perspective, the geographical reference point is not national or European, but planetary, as it is oriented towards everything that happens beyond our individual territories. The scale of the fashion project thus extends from the 'human body' to the 'body-planet'. It is also in this cosmic space that RHITA transcends geographies and arranges practices and projects in a perspective of expanded materiality.

DIGITAL AS REVELATION AND "UNVEILING"

In recent decades, the discourse on digital technology has long oscillated between two extremes: on the one hand, the promise of liberating dematerialisation, and on the other, the denunciation of alienating virtualisation. However, both of these positions appear partial and lacking in a more complete truth. In fact, both points of view share a problematic assumption: the idea that digital technology is an immaterial elsewhere, separate from the concreteness of matter and physical space.

As Timothy Morton reminds us, 'there is no away': there is no *elsewhere* to expel what exists and what we produce. (Morton, 2016). Artefacts – whether material or digital – cannot be projected outside the physical world, because there is no other space outside it. The digital is therefore matter, and the illusion that the digital involves a progressive loss of material consistency is increasingly inadequate. Every digital operation involves physical infrastructure, energy consumption, resource extraction, computational processes and data production, all of which have their own specific material density. In this sense, even the digitisation of the *RHITA* ecosystem, through its web platform, is physical. The perspective of this contribution is that, through digital technology, RHITA has thickened the materiality of the fashion project, adding layers of information to the results of its research and practices. The fashion artefacts that the project has created do not exist only as tangible entities, but take shape through a set of images, texts, sounds and stories that amplify their field of presence and consistency.
The materiality that emerges is therefore expanded: a hybrid materiality in which the physical and the computational coexist without hierarchies, giving rise to new regimes of visibility, value and agency. Whether tangible or intangible, the material that the RHITA project reshapes is a flow of information in which physical properties are linked to virtual ones. When we consider the technologies employed in fashion, such as the 2D or 3D digitisation of artefacts, or the use of VR, AR or AI, it is clear that these are not merely digital tools, but rather co-agents of 'reshaping', actively participating in the definition of how an object can be configured or experienced.
In particular, the *RHITA* ecosystem operates within a circular and transparent design perspective, where nothing is hidden or obscured. On the contrary, the material dimension – including waste or that concealed by digital technology – emerges as the most interesting component to manipulate. The industrial symbiosis developed in the two case studies 'Rethinking Metal Scraps' and 'Contemporary Jewellery from Metal Waste', which work with metal waste, redesigns production chains that are no longer linear but circular or, better, unexpected and rhizomatic networks that come to life through functional connections. In both the project developed by the University of Siena and the one trialled by the University of Campania, the residues produced by metal manufacturing become active resources capable of reconstructing new regenerative cycles for the redesign of sustainable accessories and jewellery.

In both projects, through the use of AI to visualise possible configurations, or through photographic work on metal waste, from micro to macro, the discarded material is given back a great potential for reprocessing to create innovative production chains. In the field of contemporary jewellery (Scarpitti, 2019), in particular, this type of research can lead to unique material and technological innovation, experimentation with new manufacturing processes, and interest in potential circular economies.
Among the material digitisation processes tested in RHITA are the digitisation of historical archives through the redesign and reinterpretation of antique garments, the optimisation of digital modelling with a zero-waste approach, the use of digital passports and AR labels, the use of AI for envisioning and collection building practices, and the development of strategic digital services for garment sharing. These and others are just a few examples of how the RHITA project has expanded the materiality of fashion through digital technology.
In relation to the physical-digital dichotomy,

therefore, the digitisation of matter becomes a device for revealing other qualities of the physical object. From this perspective, digital technology is not simply a tool for bringing matter back to a visual plane, but a way of enriching the artefact with additional elements or relationships that would otherwise be opaque. Digital technology thus contributes to a deeper appreciation of matter: hybrid, transversal and multidimensional.
In *RHITA*'s 3.0 platform, for example, the material dimension of research expands and, by reporting on regional excellence, production narratives and design experiments, focuses on complementary aspects of the fashion supply chain. The territorial structures (section: shape fashion made in Italy), the voices of the best practices interviewed (section: reshape fashion made in Italy) and the experiments carried out (section: RHITA projects) reveal a complex creative ecosystem that operates in different ways on the fashion supply chain, balancing sustainability and digital technology. [Fig. 01]

The large amount of data produced by the fashion system has led the *RHITA* project to restore greater transparency and legibility to the processes and practices it has triggered. Claiming for transparent fashion means, in fact, questioning the planned obsolescence of garments, restoring value to every fragment of material used and energy produced, and raising awareness among individuals about what they buy and consume. (Marcadent & Scarpitti, 2025).
In an expanded materiality framework, digital technology does not dematerialise matter, but rather thickens it, multiplying its levels of knowledge and meaning. In fact, it adds layer upon layer, producing new forms of materiality: images, processes, relationships, data, algorithms. (Hui, 2016).

From this perspective, starting from the four Italian manufacturing regions, the RHITA platform promotes local craftsmanship with the aim of promoting it both nationally and globally. The visualisation of the territories' manufacturing excellence, through images and voices, aims to disseminate and expand the tacit knowledge of Made in Italy in order to rediscover new relationships and potential connections. In the *RHITA* project framework, digital technology is therefore not an 'elsewhere' but a physical force that shapes the physical world and, in this sense, could be interpreted through Heidegger's notion of unveiling - *aletheia*: "technology is not simply a means. Technology is a mode of unveiling". (Heidegger, 1954/1991). The unveiling referred to by Martin Heidegger is understood as active energy hidden in nature, which, transformed and reprocessed, becomes the subject of new incessant transformations.
The following four actions summarise the specificities that the RHITA fashion ecosystem has attempted to unveil through its digital platform:

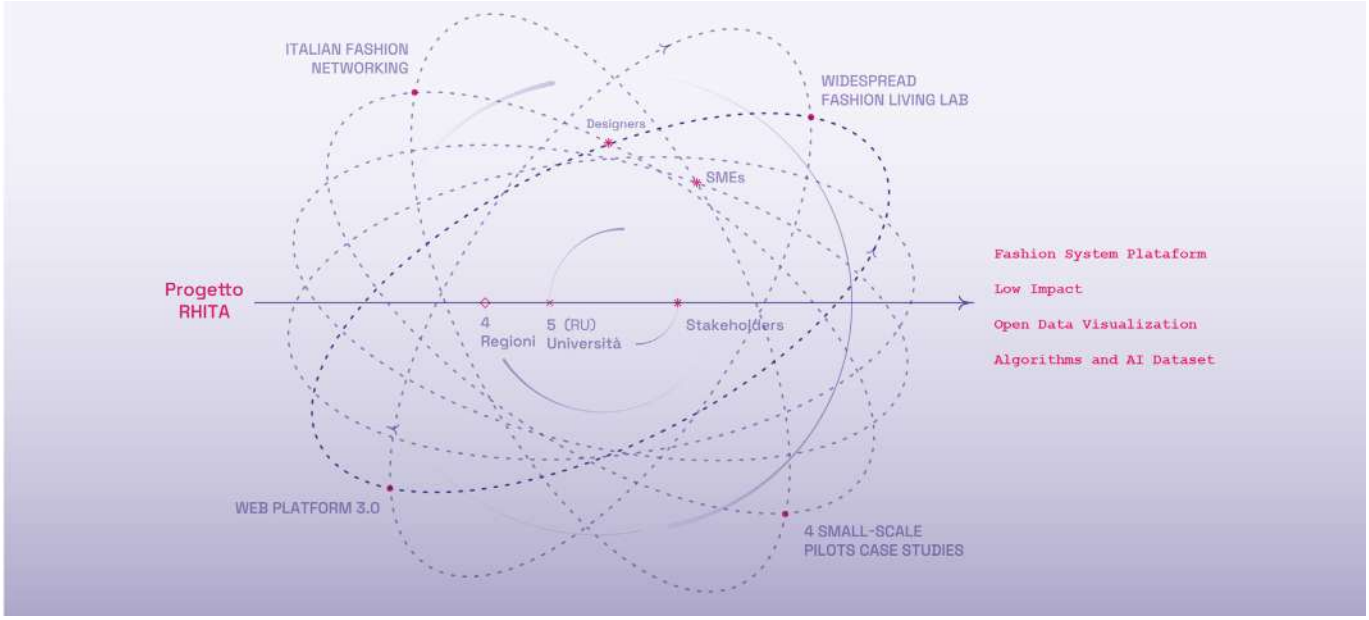

Fig. 01

• *Transparency as a political act*: the project mapped a series of production chains, as well as over three hundred companies of excellence in the four regions involved, systematising knowledge both within and outside the network. The possibility of listening to around ninety audio clips featuring the voices of producers adds greater depth and complexity to the reshaping process.
• *Open consultation*: the platform is open access, implementable and searchable. Through the use of the 'Oracle' section, it responds to users to reveal the geographical locations, data and knowledge gathered from the three mappings conducted (education, production, human capital).
• *Evolutionary trajectories*: RHITA uses digital technology to expand the value chain of contemporary fashion and guide possible design developments in different segments of the supply chain, in accordance with the three guidelines - circular, education and phygital - that filter and motivate the selection of best practices.
• *Material reclamation*: RHITA showcases various fashion-oriented experiences that adopt post-consumer waste to reinvent new supply chains and projects. The waste used includes dead stock garments, fabric scraps, recovered leather, and manufacturing waste from other industrial manufacturers. Looking ahead, the platform also intends to incorporate an energy consumption analysis system that makes explicit the amount of CO2 emitted by the digital system. Compensation can be rebalanced through the implementation of new circular processes whose actual impact can be verified.

ENTANGLEMENT AND GRAVITATIONAL FIELDS: THE IMAGINATIVE SCENARIO OF THE RHITA PROJECT

The RHITA project attempts to translate into design operative configurations certain theoretical principles that emerge from quantum physics and can be found in Ferrando's theories of neomaterialism and Barad's agency realism.
In this perspective, the RHITA ecosystem is conceived as a complex relational system, constructed through an analogy between its operational network and the functioning of certain phenomena observable in physics, such as entanglement and gravitational fields. This affinity is not merely metaphorical, but becomes a visual design tool capable of guiding new modes of collaboration within the fashion system.
This approach is also reflected in RHITA's visual identity project, which echoes the shapes, lines, colours and language of the two physical phenomena. Orbits, masses of dots, directional arrows, tilting planes, particle vortices and moving straight lines make up RHITA's graphic universe. This identity is not only aesthetic but also functional, reflecting on some behaviours of the

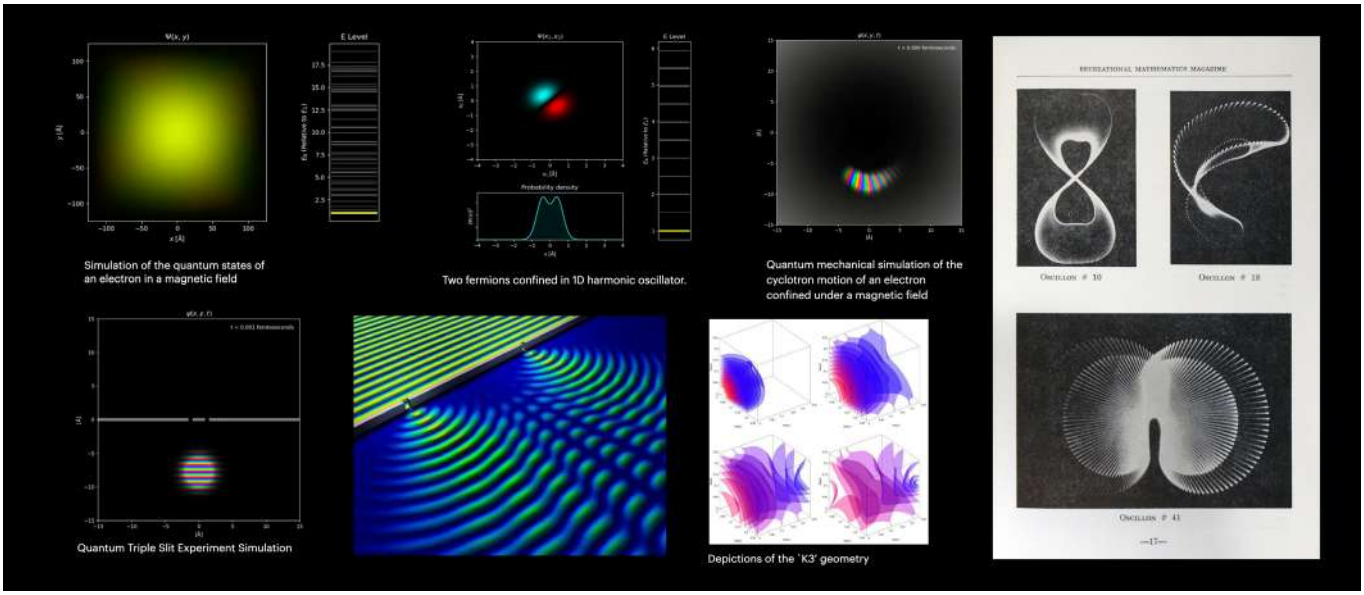

Fig. 02

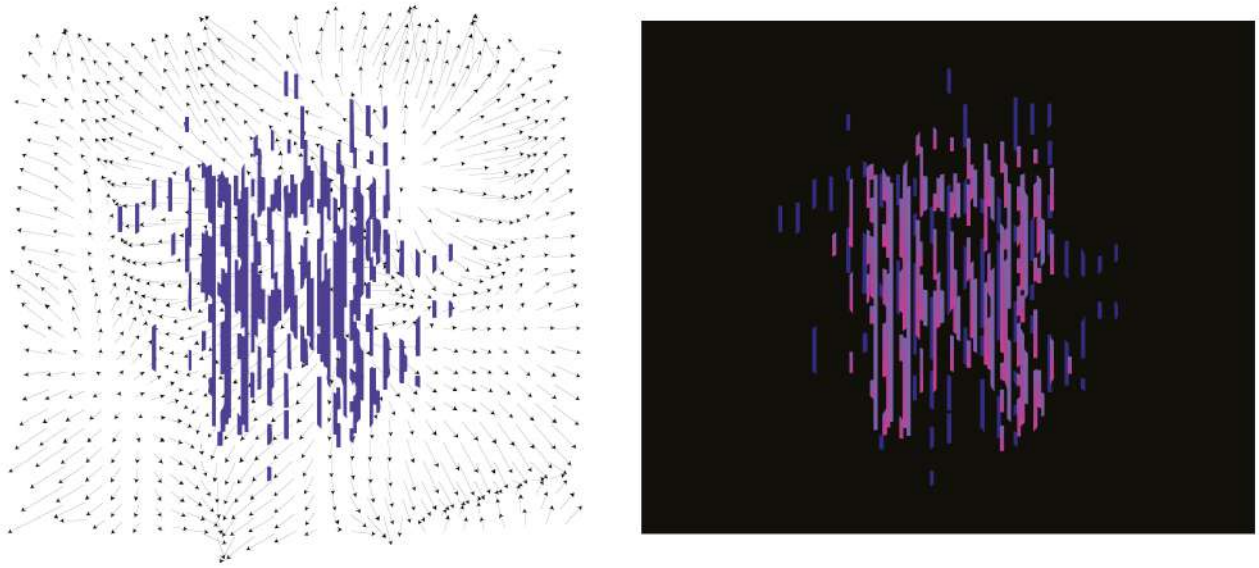

Fig. 03

creative ecosystems [Fig. 02].
A significant example of this translation between theory and design is represented by the project logo, whose development is inspired by the phenomenon of diffraction. In quantum physics, diffraction describes the way in which waves and particles change their trajectory when they encounter an obstacle or a slit, generating an interference pattern. Transposed into the graphic language of RHITA, this logic produces a dynamic logo in which the letter 'R' emerges not as a stable form, but as the result of the superimposition of a linear screen that acts as a dynamic lens capable of bringing the figure to the surface only through movement and interaction between visual layers [Fig. 03].

Within this framework, the concept of entanglement occupies a central position. In quantum physics, it refers to the phenomenon whereby two particles can be instantly correlated even when separated by great distances. In the context of the RHITA project, this concept is taken as an operational metaphor to describe a structural condition of co-implication between actors, materials, technologies and infrastructures. "There are several material-discursive forces – including some that are labelled as social, cultural, biological, geopolitical (...) – that can play an important role in particular interrelated (entangled) processes of materialisation." (Barad, 2007).

As stated by Barad's agency realism, entanglement describes a reality in which entities do not precede relationships, but emerge through specific intra-active configurations. Through the fashion-oriented practices explored by the project, the phenomenon of entanglement is symbolically reflected in a vision where actors, production chains, environments and resources are intrinsically connected and potentially related, even if at a distance. On a practical level, this paradigm implies that subjectivity, supply chains, digital tools, contexts and materials cannot be separate entities, but are phenomena that co-constitute each other and acquire meaning in relation to each other. In this sense, entanglement is taken up by *RHITA* as an operational mode of encounter capable of replacing linear and defined production models with more open, distributed and potentially unpredictable collaborative configurations.
The project's digital infrastructure, which coincides with the web platform, translates this relational vision into a shared operating environment. To promote the reshaping of production chains towards forms of sustainable and technological innovation, the five research units collaborated on the design and parallel testing of multiple practices, encouraging sustainable and technological experimentation from multiple perspectives.
The *RHITA* web platform is part of a dynamic and responsive domain which can be updated in real time by the entire network. Acting as a shared

observatory, during the project, various activities were carried out to test the platform and evaluate its effectiveness. These activities promoted co-creation processes and the direct involvement of different types of users, including fashion course students and regional stakeholders. This ensured their direct involvement in the co-creation processes. These meetings verified that the digital ecosystem could support experimentation processes and trigger new intersections, connections, and unusual possibilities for inter-activity.

Alongside the concept of entanglement, RHITA uses the metaphor of the gravitational field to describe the dynamic structure of the fashion system. In physics, a gravitational field represents a continuous space within which bodies with mass exert a mutual force of attraction, modifying the curvature of the surrounding space. Similarly, the fashion system can be interpreted as a distributed relational field in which actors, institutions, businesses and creative communities act as poles of attraction with different symbolic and economic densities. As a dynamic space where each actor influences the others, there are forces in the fashion system, some stronger than others, that act as attractors, determining curves, trajectories, instabilities, dynamics of centrality and periphery, and relationships between nodes of different mass and specific power.

Within this field, the five partner universities involved in the project and the companies involved function as masses with high symbolic density, capable of influencing the cultural and productive trajectories of the system. Fashion students, the most external stakeholders, tend to orbit around these poles of attraction, as do fashion enthusiasts, generating a catalysis towards these new practices. The structure of the field is not static. The symbolic analogy between the fashion system and gravitational fields not only describes an existing physical topology, but also allows us to imagine possible reconfigurations of the field. The reshaping carried out by RHITA is aimed at increasing the 'specific mass' of very small and medium-sized fashion design companies dedicated to sustainability and technological innovation, transforming them into global attractors for conscious innovation. In the same way, it also restores value to consumers who orient their purchasing behaviour towards green and recycling practices. Furthermore, digital connectivity eliminates physical proximity, usually understood as necessary, and makes it possible for 'micro fields' of force to exist that are capable of competing symbolically with large centres, even at a distance. The concept of a distributed field of forces also emerges within the web platform through the 'Oracle' section, which features interaction assisted by artificial intelligence systems. This tool allows external users to query the body of research developed in the project, facilitating the sharing of scientific work with students, SMEs, stakeholders and communities of enthusiasts. Building this knowledge base required selecting, organising and curating the data produced during the project, turning the platform into a dynamic archive of constantly evolving knowledge and practices.

Balancing sustainability and technology, RHITA showcases a variety of design approaches, promoting a non-protectionist vision of Made in Italy that is part of global creative exchange circuits. In this scenario, by deconstructing the anthropocentric principle, fashion emerges as the result of heterogeneous assemblages (Haraway, 2016) involving human and non-human actors, materials, production processes and digital technologies. As Francesca Ferrando observes, "the human presents itself as a network of energies, alliances, materials and perspectives, connected to every other form of existence through (an indefinite number of) material synergies, in relation to various and possible quantum dimensions" (Ferrando, 2016).
Applying this vision to the role of the designer in the fashion system radically transforms it, as design responsibility extends to managing long-term consequences, protecting ecosystems and establishing ethical models of coexistence and care. Embodied in a material network, this involves recognising ourselves as attractive and transient nodes in the planet's metabolism, and accepting responsibility for the relationships we help to weave.

On a design level, the twelve fashion-oriented practices developed by the five research units have combined sustainability and digitality, involving fashion students from bachelor's and master's degree courses at various universities, guiding them towards more sustainable behaviour throughout the entire production chain and in dialogue with companies [Fig. 04].
Sustainability is represented here not only as an alternative model but also as a systemic friction. The criterion of sustainability is not just a goal to be achieved but becomes an internal disturbance that slows down the system: through projects

such as 'Yamamay Reloaded' – precisely because it is applied to a fast fashion supply chain – the principle of circularity acts as a disruptive force that introduces a change of governance in the accelerationist, extractive and performative logic of the fashion system. In this sense, sustainability does not coincide with pure efficiency, but with the suspension of a previous operating system, and acts as a critical device to slow down production flows and expose the material, energy and social costs that the capitalist system tends to conceal.
As the RHITA project demonstrates, the fashion system should not be understood as a set of isolated objects, but as a field of intra-active forces in which materials, technologies and bodies come together. In line with Fletcher's view, sustainability requires a systemic approach: "sustainable fashion requires an approach that considers materials, production, use and disposal together" (Fletcher, 2014), thus transforming each element into a co-agent responsible for building resilient fashion ecosystems.

According to the notion of limits defined by the economist Serge Latouche (Latouche, 2012), thinking of sustainability as a disruptive stimulus means recognising its inherently conflictual nature. By deviating from dominant models, these approaches open up alternative trajectories based on care, invention, individual responsibility and conscious reduction of the superfluous.

CONCLUSIONS – TOWARDS A MANIFESTO FOR INTRA-ACTIVE FASHION

One of the main findings of this study is that the RHITA project can be analysed as an experimental ecosystem of evolving fashion practices, providing a structural and theoretical rethink of the fashion system.
Through analysing the project, the essay presents a vision of the fashion system as a field comprising heterogeneous forces and connections between materials, individuals, technologies, processes, and geographies. In this field, none of these agents is central, and no trajectory is predetermined; instead, dynamics emerge from attractions, tensions and instabilities that propagate throughout the system. Fashion thus becomes a dynamic environment and a relational ecosystem, in which forms are activated through intra-action rather than imposed.

Concerning the project's sustainability criterion, the design experiments conducted at RHITA embrace sustainability not only as an optimisation of the current fashion system, but also and above all as a form of friction within the system — a recognition

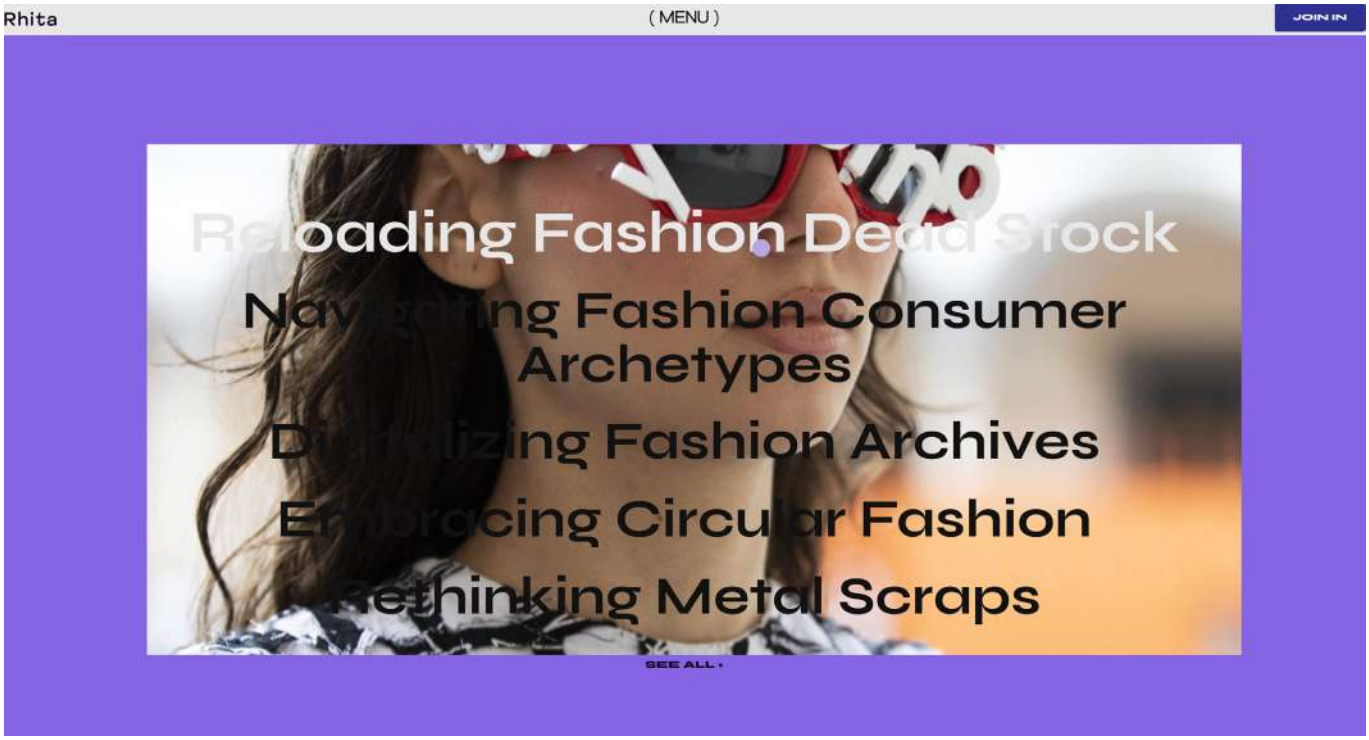

Fig. 04

of the planet's limits and its finite resources.
Starting from the theoretical reflections outlined and the fashion-oriented practices experimented with, it is clear that the RHITA ecosystem envisages a future for fashion that does not lie in indiscriminate acceleration, but in the ability to critically observe reality, slow down and reorient flows.
The project's distinctive materiality also dissolves the traditional distinctions between the physical and digital, the human and non-human, and the tangible and intangible. It is no longer attributable to distinct domains, but emerges as an evolving network of interactive relationships. If fashion is understood as an intra-active field of forces, the digital can only be understood as one way in which this field is articulated and densified, on a par with physical matter.
As a summary of the paradigm shift achieved by the project, here are ten points for intra-active fashion:
1. Italian fashion transcends geography.
2. Made in Italy is relational.
3. Sustainability as an existential condition.
4. The fashion product is an unstable assemblage.
5. Every fashion product has physical and digital states.
6. Materials are co-agents.
7. Digital is material.
8. Circularity is an uninterrupted flow.
9. Efficiency means taking care.
10. Intra-action instead of inter-action.

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CAPTIONS

[Fig. 01] RHITA Ecosystem: a summary graph showing the network's constituent actors.

[Fig. 02] RHITA visual identity inspiration board: Credits Pluff Studio.

[Fig. 03] RHITA project dynamic logotype. Photo credits sx: Chiara Scarpitti and Giulia Scalera. Photo credits dx: Pluff Studio.

[Fig. 04] RHITA. ResHaping made in ITAly web platform | RHITA Projects: https://www.rhita.eu/rhita-projects/

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BETWEEN FRAGMENTATION AND CIRCULARITY:

DESIGN DIRECTIONS FOR THE TRANSITION OF ITALIAN FASHION

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Abstract

The transition to circular models in Italian fashion is not primarily a technical challenge, but a systemic one. In the context of an industry characterised by fragmented production, local SMEs and distributed knowledge, circularity primarily emerges as a widespread capacity for coordination, resemantisation of value, and integration between technological innovation and local skills. Based on the analysis of three case studies (a community platform, an automatic classification technology system, and a material processing company) and ethnographic observations of creative micro-enterprises, this article analyses how services, organisational configurations and local infrastructures enable or hinder the circular transition in the Italian context. The study identifies four interconnected barriers (economic, technical, cultural, and regulatory) that require coordinated action. In response, it proposes three design directions: (1) enabling infrastructures that bring together fragmented actors without imposing centralisation, (2) re-semantisation of value through narrative and experiential design, (3) configuration of hybrid technological-artisan processes. This study highlights how integrated design approaches, rather than isolated technical innovation, are the critical lever for making circularity economically sustainable, culturally desirable, and operationally feasible in the context of Italian territorial SMEs.

Keywords: *Fashion circularity, Design for sustainability, Fragmented supply chains, Enabling infrastructures, Territorial governance*

INTRODUCTION

The Italian fashion industry represents a productive and cultural ecosystem deeply rooted in the national territory (Bertola & Linfante, 2015), characterised by specific peculiarities including the concentration of specialised technical skills in industrial districts (Brun & Castelli, 2008), the prevalence of SMEs and the recognised symbolic association between product quality and the Made in Italy brand (Pinchera & Rinallo, 2022). Based on this structural model, the Italian fashion system has historically built its competitive advantages through differentiation, innovation in design (Bertola & Colombi, 2024) and positioning in the mid-to-high and premium segments of the market (Runfola et al., 2022). Today, in a critical transition phase in which manufacturing longevity must be reconciled with the environmental and social constraints affecting the entire supply chain, these competitive advantages need to be reconsidered and renewed in light of emerging sustainability and responsibility criteria. In this context, the Italian fashion system operates as a heterogeneous ecosystem distributed throughout the country, connecting historic textile and manufacturing districts (Rinallo & Golfetto, 2006), metropolitan creative hubs (d'Ovidio, 2015), and emerging digital native companies (Colombi & D'Itria, 2023), thus forming a complex and interconnected network of actors that is grafted onto global value chains but maintains strong local roots. As is well known, globally, fashion is responsible for significant environmental and social

impacts throughout the entire product life cycle (Niinimäki et al., 2020), contributing significantly to carbon emissions, water consumption and textile waste generation (Peters et al., 2021; Shirvanimoghaddam et al., 2020), as well as perpetuating often critical working conditions (Bick et al., 2018) at various points in the supply chain. The Italian fashion system, with its specific production and cultural characteristics, is also affected by these dynamics (Tebaldi et al., 2022): dependence on global value chains, increased competitive pressure and the development of models for rapid market entry cumulatively lead to the perpetuation of unsustainable conditions that put pressure on the classic model of qualitative excellence.

At the same time, the Italian fashion system is structurally embedded within a broader European context of commercial and regulatory relations, in which the European Union acts as a promoter of new and stringent sustainability standards and requirements for the entire textile and clothing sector. European initiatives – from the EU Strategy for Sustainable and Circular Textiles to the proposed Ecodesign for Sustainable Products Regulation (ESPR) – are introducing, among other things, requirements for eco-design, durability, extended producer responsibility and traceability (European Commission, 2020), which require the Italian fashion system to realign its organisational models and design cultures while maintaining both competitiveness and cultural authenticity. Nevertheless, the application of these principles is hampered by structural issues that have to be understood and dealt with, particularly in fragmented production contexts such as Italy.

This article is situated within the national research project PRIN 2022 PNRR "ResHaping made in ITAly (RHITA). Circular models for Italian fashion heritage and manufactures through digital inclusivity and conscious innovation", which addresses the transition of Italian fashion towards circular and inclusive models by leveraging design-driven innovation across distributed manufacturing ecosystems. In this complex transition scenario, the article investigates how Italian fashion is finding its own way to reorient itself towards more sustainable and circular models, focusing in particular on forms of innovation capable of redesigning organisational configurations, business models, and processes. Starting from an analysis of three circular fashion organisations operating in Northern Italy, complemented by observations on creative micro-enterprises and independent designers, the research investigates how particular infrastructures and ecosystems facilitate such a transition. Specifically, the research addresses three main issues: (i) analysing how the transition to circular fashion models is manifesting itself today in the Italian context, highlighting emerging trajectories of organisational and business innovation; (ii) exploring the economic, technical, cultural and institutional barriers that hinder this transition, highlighting how these barriers are intertwined in territorially rooted production systems; (iii) identifying design directions capable of strengthening the circular transition in Italian fashion, consistent with the fragmentation of the supply chain and the forms of relational governance that characterise the Italian production system.

CIRCULARITY IN FASHION: ECOSYSTEMS, DESIGN AND FRAGMENTATION

The literature on fashion and sustainability highlights how circularity has become one of the main strategies for reducing the environmental and social impacts of the sector (de Aguiar Hugo et al., 2021), acting on production and consumption models (Mukendi et al., 2020) and textile waste management. Within this debate, work on circular fashion highlights the existence of multi-level barriers – economic, technical, cultural and institutional – that hinder the widespread adoption of more sustainable and circular practices throughout the supply chain (de Aguiar Hugo et al., 2021; Mishra et al., 2020; Schiaroli et al., 2025). In the Italian context, several studies show how the circular transition is linked to a production system characterised by manufacturing districts (Brun & Castelli, 2008), strong territorial roots and a prevalence of SMEs (Runfola et al., 2022), forming a fragmented supply chain that is nevertheless rich in local skills (Aage & Belussi, 2011; Colucci & Vecchi, 2021; Rinallo & Golfetto, 2006). While Made in Italy has become a symbolic competitive factor, implementing a circular approach is hampered by structural constraints on resources, relational governance, and the complexity of coordination across multiple scales (Tebaldi et al., 2022). At the same time, the new regulatory environment in the European Union, and its new Action Plan for a circular economy in particular, is increasingly

forcing a reorganisation of the textile and fashion sectors through eco-design rules, extended producer responsibility, digital product passports, etc., in order to translate environmental goals into business constraints (European Commission, 2020; Götz et al., 2022). This combination of top-down regulatory drivers and widespread production skills makes the Italian case particularly relevant for studying how circularity is translated into organisational configurations, business models and service infrastructures capable of coordinating supply chain actors (Colucci & Vecchi, 2021). This highlights the need to understand the barriers and operational configurations that characterise the circular transition in fragmented and territorially rooted production ecosystems. The design for sustainability approach shows how design action must gradually shift from the product level to supply systems and socio-technical transitions (Ceschin & Gaziulusoy, 2016), linking material devices, services (Vezzoli & Manzini, 2008), and organisational configurations (Rocha et al., 2019). In the fashion industry, this shift implies considering designers not only as creators of collections, but as actors capable of orchestrating platforms, services and infrastructures that enable circular practices along the supply chain (Dan & Østergaard, 2021) - from designing for durability and repairability (Kozlowski et al., 2018) to managing post-consumer flows (Aakko & Koskennurmi-Sivonen, 2013).

The literature on sustainable and circular business models emphasises the role of supply schemes that combine products, services, and networks of actors to slow, close, or restrict resource flows (Bocken et al., 2014, 2016; Coscieme et al., 2022). In particular, studies dedicated to fashion highlight the emergence of platforms and service solutions – such as circular marketplaces, rental models, and advanced collection and sorting systems – as enabling infrastructures that redistribute fixed costs and logistical complexity (Huynh, 2021), making reuse, upcycling and recycling practices in SME contexts (Colucci & Vecchi, 2021; Dragomir & Dumitru, 2022; Todeschini et al., 2017). However, the literature only addresses in a fragmentary way how systemic design approaches (Ceschin & Gaziulusoy, 2016) and circular business models (Bocken et al., 2014) are concretely translated into territorial organisational configurations in the contexts of Italian fashion SMEs and micro-enterprises, where production fragmentation and relational governance (Aage & Belussi, 2011) are structural elements.

METHODOLOGY

The research adopts an exploratory qualitative approach based on multiple case studies (Yin, 2009) to investigate how the transition to circularity in Italian fashion manifests itself operationally. To this end, and through a theoretical sampling aimed at representing complementary configurations of scale, organisational model and positioning in the supply chain, three circular fashion organisations operating in Northern Italy were selected. At the

Organization	Type	Main Service	Scale	Material Inputs
Appcycled	Digital Platform + community	Marketplace, pop-up, workshop	National (Italy)	Deadstock fabrics, production waste
Atelier Riforma	Tech provider B2B	AI Classification + marketplace B2B	National/EU	Post-consumer garments
Pulvera	Material innovation	Textile pulverisation and consulting services	National/EU	Pre-consumer textile waste
Indipendent Designers	Creative Micro-enterprises	Upcycling, repair, and bespoke services	Local (Milan)	Scraps, deadstock, and second-hand clothing

Tab.01

same time, observations were collected on creative micro-enterprises and independent designers in order to understand how circular practices based on small-scale initiatives and design or craftsmanship knowledge intertwine with the innovation trajectories identified in the primary case studies, helping to shape a heterogeneous territorial ecosystem of services, relationships and infrastructure to support the transition. [Tab. 01] The empirical material was collected between May and October 2025 through three sources:

- Semi-structured interviews (approximately 45 minutes) with one or more founders of the three organisations, covering topics such as operational configuration, stakeholder relations, challenges and perceived barriers.
- Documentary analysis of websites, social media, and public reports to enable triangulation and reconstruction of information relating to the organisations.
- Ethnographic observations of micro-enterprises and independent designers in Milan, focusing on upcycling, repair and transformation of waste materials. These observations were useful for understanding the local context and highlighting the diversity of operational scales within the Italian circular fashion ecosystem.

Finally, the data acquired was compared with the theoretical framework and the themes that emerged were grouped into three areas: organisational configurations for circularity; multi-level barriers (economic, technical, cultural, institutional); emerging design directions, understood as possible lines of development for services, business models and territorial infrastructures.

ORGANISATIONAL CONFIGURATIONS FOR CIRCULARITY IN ITALIAN FASHION

This section presents an analysis of three Italian entities with distinct approaches to circularity: a community platform that integrates small upcycling designers, an AI-driven technological classification system for post-consumer textiles, and an industrial-scale material processing company. Alongside these structured cases, observations on micro-enterprises and independent designers in the Milan area complete the picture of the Italian circular ecosystem. The concluding section (4.4) summarises the cross-cutting barriers that emerge from all contexts.

COMMUNITY-SCALE ENABLING INFRASTRUCTURE: APPCYCLED

Founded in 2020, Appcycled operates as a digital platform and physical space that connects designers specialising in upcycling with recycled materials, jointly addressing the valorisation of textile surpluses and supporting small, independent designers. The organisation faces a twofold challenge: on the one hand, providing visibility and sales channels for emerging designers who work with waste, deadstock, and end-of-line stock; on the other, channelling unsold fabrics and production stock towards creative reuse rather than disposal. Appcycled integrates three complementary levels of service: a digital marketplace that enables the direct sale of upcycled products; temporary physical spaces (pop-up stores, exhibition events) where designers can present their collections and meet potential customers; and a "community infrastructure" consisting of workshops and informal events that - even indirectly - can support knowledge sharing, peer learning and mutual support. As one of the co-founders points out, over time, the platform has built "a community so that emerging designers feel a little less alone", allowing them to collectively access resources that are difficult to sustain on an individual level. At the same time, it has expanded to a community of "non-professionals" interested in the creative reuse of high-quality materials at reduced prices. In this perspective, Appcycled acts as an intermediary between outgoing textile flows – unsold inventory, production waste, materials from closing ateliers – and designers or hobbyists seeking quality materials for upcycling.

The organisational model allows, at least in part, for the sharing of specific resources and skills among designers – in particular, collective visibility through the platform, joint communication activities and opportunities for collaboration on services such as photoshoots – only partially alleviating the burden of having to manage all the activities associated with creative micro-entrepreneurship alone. Nevertheless, the economic scalability of unique pieces or small batches remains structurally problematic: as one of the interviewees pointed out, "the costs of photo shoots, online cataloguing, social media

sponsorship for a single piece... all this erodes the profit margin of the individual garment", making it difficult for these independent designers to achieve economic sustainability. Appcycled thus tends to position itself in a relatively narrow market segment, consisting of consumers interested in sustainability – mainly young people – but also price-sensitive, and designers engaged in circular practices operating on limited margins.

Observations regarding independent design and small-scale creative initiatives in the Milan area suggest that similar models exist, based on the recovery of unused stock, direct sales to consumers and community involvement through workshops, but that they are scattered and, in some cases, lack a consistent infrastructure. In this context, Appcycled's role can be seen as an attempt to formalise and promote scattered initiatives by providing a common platform to support community involvement in the wider circular fashion system.

From a design perspective, Appcycled demonstrates how community-based platforms can partially offset the structural diseconomies of scale in artisanal upcycling, but they also risk remaining confined to a niche segment if not supported by broader enabling infrastructure and mechanisms.

TECHNOLOGICAL INNOVATION AND SUPPLY CHAIN COORDINATION: ATELIER RIFORMA

Founded in 2019 as a start-up and now operating as a social enterprise, Atelier Riforma positions itself as an "enabler" of circular fashion, with a specific focus on managing post-consumer textile flows. At the heart of the organisation is Re4Circular, a patented, proprietary, artificial intelligence-based automatic classification technology that improves the process of cataloguing post-consumer garments, extracting and recording their relevant characteristics, and directing them towards the most suitable circular path (reuse, upcycling, recycling), overcoming the limitations and time constraints of manual selection. Re4Circular operates through two integrated approaches: on the one hand, it supports organisations and cooperatives that manage the collection of used clothing, enabling them to classify garments and direct them towards circular destinations automatically; on the other hand, it provides entities such as upcyclers, recyclers and reuse operators with a supply infrastructure that makes available a "sustainable inventory" suited to different process requirements. In this sense, Atelier Riforma is defined by its founder as a "facilitator" that channels as much post-consumer textile waste as possible to appropriate destinations, helping to build an infrastructure that remains fragmented today. According to the founder, the increased focus on circularity over the last five years is only partly due to a change in awareness within the fashion supply chain. Instead, it seems to be driven more strongly by an "external regulatory push", namely European regulations that require the textile and fashion industry to reduce waste and encourage reuse, recycling and upcycling practices. In this way, the technological strategy proposed by Atelier Riforma responds to a new need for operational instruments capable of turning a regulatory need into a specific process for the management and improvement of post-consumer flows.

The platform's experience also highlights specific constraints in the post-consumer segment, first and foremost, the technical challenges associated with managing garments produced before the introduction of eco-design principles (desirable, but still not structurally adopted today), which make it challenging to recover garments designed for a linear life cycle. In this scenario, Atelier Riforma's contribution should be seen as an attempt to build a digital and market infrastructure capable of making the post-consumer circularity opportunities opened up - but not guaranteed - by European regulatory developments operational in the Italian context.

INDUSTRIAL-SCALE MATERIAL PROCESSING: PULVERA

Launched as a start-up in 2024, Pulvera draws on over 70 years of experience from Casati Flock&Fibers, a company operating since 1952 and specialising in the pulverisation of textile fibres for applications across a wide range of sectors. In line with this industrial tradition, Pulvera is repositioning existing technologies and value chains in order to enhance the value of pre-consumer textile waste from the fashion industry. The aim is to "find a new life for textile waste" through pulverisation and the identification of new applications. The service offering is organised around this objective comprehensively and includes waste analysis and consulting services, pulverisation, and new product design. Pulvera

thus operates across multiple stages of the process, both upstream and downstream of production, collaborating with companies that "do not know how to use their textile production leftovers" while offering "tailor-made solutions for the recovery of textile waste". In this way, the company supports its partners in defining more effective separation flows and designing tailor-made applications that reintroduce waste into new value chains. The co-founder emphasises that part of the work consists of showing that, by initially dedicating time to mapping and correctly sorting waste, "it is then possible to implement many more recycling solutions", preventing large volumes of material from remaining undestined. The co-founder also points out that direct observation of production sites reveals that waste generation is often more of an organisational than a technical problem. Processes historically configured for a strictly linear production model seldom provide for the systematic separation of waste by composition and colour, even for more easily recyclable single-material streams. This compromises the quality of the available material and limits its possible applications. The interviewee points out that if waste were sorted not only by composition but also by colour, it would be possible to "avoid the entire dyeing process", maintaining the colours already applied and reducing the use of water and dyes in solutions developed with textile powder. Compared to other cases, Pulvera's material-centric strategy highlights how organisational routines and sorting practices upstream in the supply chain can unlock or block circular opportunities, suggesting that designing for circularity must also address "invisible" process conventions rather than just visible products and services.

BARRIERS TO THE CIRCULAR TRANSITION IN THE ITALIAN CONTEXT

Based on the analysis of the three cases and observations on micro-enterprises, four categories of multi-level barriers that limit the development of circularity in fashion have been identified and summarised as follows.

- Economic and structural barriers: Circular processes (collection, sorting, repair, transformation) tend to be more intensive and operate mainly at a small scale, resulting in higher costs than linear alternatives that benefit from established economies of scale. This results in an accessibility gap that impacts, among other things, the niche market of consumers interested in sustainability – particularly younger people, who are highly sensitive but have low purchasing power - further reducing demand for "sustainable fashion". Furthermore, and even more significantly, in a production system dominated by SMEs, micro-enterprises and craft initiatives, the distribution of these costs has a particularly onerous impact on small operators (independent designers, workshops, community platforms) whose economic sustainability often depends on access to informal support networks and the use of shared spaces and infrastructure. This asymmetry also affects circular B2B operators, for whom "using existing material as an alternative to virgin material is even more expensive than virgin material", exposing models based on recycling and reuse to the risk of not being sufficiently competitive.

- Technical and material barriers: The characteristics of existing materials in circulation - namely mixed fibres, non-dismantlable designs and complex surface finishes - resulting from decades of linear design practices that did not include eco-design principles - significantly limit the use of circular reuse cycles, particularly in the recycling and transformation of post-consumer streams. Furthermore, from a purely technological standpoint, existing recycling technologies are, in some cases, costly or limited to specific categories of materials. For these reasons, implementing circular solutions requires initial organisational investments - sorting and screening infrastructure, information systems, staff training, and process redesign - which companies tend to postpone, despite the potential for medium- to long-term benefits. At the micro level, in production contexts characterised by widespread craftsmanship and micro-entrepreneurship, the scalability of circular

practices depends on the ability to translate tacit skills and case-by-case adaptations into replicable protocols and procedures: many of the services observed, based on the localised skills of artisans, independent designers and micro-enterprises, struggle to transform themselves into models that can be transferred even between similar contexts, hindering the inter-local diffusion of technical innovations developed in the field.

- Cultural and perceptual barriers: In the fast fashion segment, the spread of consumption models based on very low prices, rapid cycles and broad availability has gradually normalised clothing as a disposable commodity, eroding cultural practices of care, repair and prolonging the useful life of products. In this segment, even when awareness of sustainability is high, it competes with economic pressures and daily uncertainties and is often postponed to the future, especially among young consumers who, despite being the most interested, do not have the resources necessary to bear the cost of more sustainable solutions The luxury market is characterised by another distinct yet equally complex cultural context. Recycled materials and the aesthetic of reuse are constantly at odds with existing biases, which perceive them as of poorer quality and with "less finished or compromised aesthetics". This perception limits the integration of recycled materials into main collections, sometimes confining them to experimental or communicatively "separate" capsules from the core business. Studies on micro-businesses and independent designers show a complementary dynamic in which access to circularity is driven more by experiential and identity factors rather than mere environmental drivers. Many consumers approach it through workshops, self-production practices and the purchase of "unique pieces", valuing craftsmanship, uniqueness and relationships activated around objects; in this context, the most effective circular services in Italy are those that intertwine aesthetic and relational values with sustainability objectives.

- Regulatory and institutional barriers: The most significant regulations in the European regulatory framework - extended producer responsibility, eco-design regulations, durability and repairability criteria, and digital passports - are often seen as a burden for fashion industry operators. This view can lead to a focus on marginal, low-cost changes rather than on different business models and value chains. On the other hand, for small-scale circular businesses working with heterogeneous waste streams, traceability and documentation requirements translate into administrative burdens that are difficult to sustain when the origin of materials is partial or non-standardised. Furthermore, the geographical limitation of regulations - "the problem with European regulations is that they are European" - creates asymmetries between EU and non-EU operators in a globally delocalised production sector, generating competitive distortions without, in itself, guaranteeing the elimination of unsustainable practices along international value chains.

Together, the three cases outline intentionally complementary paths towards circularity: Appcycled operates at the community and micro-enterprise level, Atelier Riforma focuses on infrastructure and data-based coordination of post-consumer flows, while Pulvera deals with the industrial transformation of materials. By looking at circularity from these different positions in the value chain, the analysis shows that there is no single solution to resolve the systemic misalignment between circular ambitions and existing organisational configurations, and that multi-scale design interventions are needed.

DESIGN DIRECTIONS FOR A CIRCULAR TRANSITION

Empirical analysis shows that barriers to circularity in Italy are primarily systemic – production fragmentation, structural diseconomies of scale, cultural resistance – rather than technological. These interconnected obstacles require design interventions that go beyond individual products, addressing the configuration of integrated value ecosystems. Based on the three case studies and observations, three strategic directions emerge.

ENABLING INFRASTRUCTURE TO DECOUPLE CREATIVITY AND MANAGEMENT COMPLEXITY

In the context of fragmented supply chains, design could focus on the configuration of shared infrastructures for access to centralised services for low-specificity but highly complex logistical functions, such as collection, sorting, traceability and marketing, thus allowing small operators to concentrate on high-specificity activities - creativity, repair, processing. Platform solutions similar to those observed could help redistribute fixed costs (digital infrastructure, communication, market visibility) across groups of microenterprises, transforming fragmentation from an economic weakness into a systemic resource. This would allow for the redefinition of "network economies of scale" without requiring vertical integration, while maintaining the territorial specificity of the Italian productive system. A first project direction could be the development of "minimum" standard rules and formats that make it easier for different actors to cooperate without flattening their specificities. This would involve identifying a few dimensions to be standardised – for example, how to code materials or describe the condition of garments – while leaving other aspects flexible to manage the heterogeneity of circular flows without sacrificing local specificities.

A second direction could involve the design of hybrid physical nodes that integrate circular back-end functions (preliminary collection, sorting, repair, material transformation) with front-end experiences (retail, workshops). Observations of independent designers' spaces suggest that the visibility of upcycling and repair processes can significantly change consumers' perception of value; consciously designing these places as interfaces between reverse logistics and cultural experience could therefore be an important lever for the legitimisation and dissemination of circular practices.

RE-SEMANTISATION OF VALUE THROUGH DESIGN AND NARRATIVES

Since in various market segments, particularly premium ones, secondary materials tend to be associated with inferior quality or aesthetic compromise, design could aim to construct new cultural meanings around circularity. From this perspective, recovered material can be interpreted not simply as "upcycled waste", but as reinterpreted heritage, bearing history, skills and links to specific production contexts. Empirical evidence also suggests that when circularity is proposed as a creative and identity-building experience (including, for example, upcycling workshops, self-production, and the purchase of unique pieces), it also attracts consumers who do not primarily define themselves as being motivated by environmental concerns. A first direction could concern the design of an "aesthetics of traceability", in which the heterogeneity of the recovered materials is not masked but made legible as an attribute of uniqueness and craftsmanship excellence. According to this approach, an item made from waste or archive materials should not be defined as "second-hand", but rather in relation to the curatorial and design processes that give the material its symbolic meaning. A second direction could focus on designing traceability processes to build an emotional link between the user and the recovery chain. In addition to the data needed to ensure regulatory compliance, the data disclosed can and should shed light on the material's history, its origin, the local skills involved, and the environmental impacts avoided, to shift the logic of competition from price to value.

CONFIGURATION OF HYBRID TECHNOLOGICAL-ARTISAN PROCESSES

The technical barriers associated with managing heterogeneous textile flows suggest the need for a "systematisation" of functions that aims to enhance the integration between emerging technologies – such as automatic classification systems, visual recognition, industrial transformation of materials – and widespread craftsmanship skills. Design could focus on defining interface points that make these technologies accessible to small-scale operators and, at the same time, enhance the irreplaceable contribution of creative judgement and manual intervention. A promising

direction could be the design of protocols for transitioning between technology-mediated and more "traditional" phases, capable of maintaining continuity of information and meaning throughout the material's life cycle when garments or textile waste pass from automatic classification, sorting or industrial processing systems to repair, upcycling or creative design practices, the information collected (composition, origin, treatments) could accompany the material in a form that is readable and actionable for those working on the piece. Symmetrically, creative intervention, including the changes made, the methods used, and the aesthetic and cultural values integrated, can also be reintegrated into information systems to enable traceability, communication, and further processes. In this context, hybrid processes that blend technology and craftsmanship do not replace human labour with technology, but rather complementarily articulate different sets of skills to improve not only the operational feasibility of circular services, but also the aesthetic and symbolic value of their products.

DISCUSSION AND CONCLUSION

This study suggests that, in the Italian context, the circular transition is taking shape as a distributed ecosystem of initiatives operating on different scales and levels of formality, in which local craft practices, experimental design spaces, technological intermediaries and collaborative platforms collectively support circular trajectories without converging into a single centralised model. This coexistence of heterogeneous initiatives – from the community to the industrial level – does not represent disorderly fragmentation, but rather an ecosystem where territorial specialisation, relational roots, and operational flexibility allow circular processes to be adapted to the specificities of different market segments and localised skills (Bertola & Colombi, 2024; Colucci & Vecchi, 2021). However, the distributed system is structurally vulnerable due to key connections and the reinforcement of economic, technical, cultural and institutional barriers listed in Section 4.4. Economic disadvantages, in the form of unit cost penalties due to circular processes, contribute to low adoption rates and the persistence of niche markets that are too small to achieve economies of scale. The lack of disassembly and non-standardised processes is further exacerbated by resistance to change in organisations. Cultural biases, in the form of the opinion that recycled products are of inferior quality, have been shaped by the historical acceptance of the idea that products are disposable and require continuous refutation (Ozdamar-Ertekin, 2016). Institutional or regulatory barriers, such as difficult traceability conditions regarding questionable sources and the spatial scope of EU laws, place excessive pressure on micro-enterprises and can therefore be considered an obstacle to effectiveness.

Fragmentation creates a contradictory dynamic that simultaneously displays resilience and vulnerability. Diversity allows for widespread experimentation and contextualised adaptation, but hinders infrastructure standardisation, structural economies of scale, and the construction of a shared public discourse able to give circular initiatives sufficient visibility and legitimacy. The three cases represent efforts to manage these complexities at different levels—community, technological, and material—but sustainability depends on collective transformation across all four dimensions: economic, technological, cultural, and institutional. Furthermore, the three case studies show that the circular transition in Italian fashion revolves around three critical and interconnected aspects. Firstly, from the analysis, it can be deduced that, in the context of fragmented systems such as Made in Italy, the design of circular services is not simply a matter of isolating processes, but rather a matter of developing infrastructural ecologies that act as a bridge between the various autonomous actors, in order to allow them to participate in circular dynamics without losing their autonomy and specificity. At the same time, a problem arises, as the most efficient platforms (such as Atelier Riforma) exhibit a certain degree of standardisation, while more local projects (such as Appcycled) struggle with economic scalability. This suggests that the design of infrastructure for fragmented systems requires a dynamic balance between coordination and autonomy, which is difficult to achieve. Secondly, the article highlights that the cultural and semantic dimensions of value precede and enable economic scalability, contrary to what the literature on circular fashion often assumes (which often focuses on recycling and logistics technologies). As evidenced by the Pulvera cases and observations on independent designers, the re-semantisation of recovered material is not an optional strategy, but a precondition for justifying the premium price necessary to cover

the real costs of circular processes. In the luxury segment, this means radically transforming the cultural meaning of recycled materials—from "environmental compromise" to "reinterpreted heritage" steeped in history and expertise. In creative niches, it involves emphasising uniqueness, identity, experience and community participation as forms of value commensurate with price. However, this re-semantisation remains fragile: it depends on the narrative consistency maintained by individual actors and on the consumers community' ability to recognise and value these alternative meanings (Fletcher, 2016; Mazzarella et al., 2019). The risk is that without infrastructure to support this collective narrative, re-semantisation will remain confined to isolated niches. Thirdly, the design of hybrid technological-artisan processes offers a means to mediate the tension between technological standardisation and territorial uniqueness, though its practical implementation poses significant challenges. In the Italian context, both advanced technological innovation (AI for classification, blockchain for traceability) and localised artisan skills are present and strategically important. The conscious merging of these aspects has the potential to deliver unique value; however, as the cases demonstrate, it is not necessarily an automatic process. The example of Atelier Riforma shows that technology can increase the efficiency of the selection process; however, the inconsistent quality of incoming materials remains an issue linked to suppliers' organisational and cultural practices. Similarly, the artisan workshops observed use digital traceability tools sporadically, often for regulatory compliance rather than strategic value. This suggests that technological-artisanal hybridisation requires not only skills, but also a redesign of workflows that is not yet systematic.

Overall, these three aspects suggest that the circular transition in the Italian fashion industry is not so much focused on the adoption of superior technologies or regulatory issues, but instead on the simultaneous design of hybrid infrastructures, meanings and processes.The advantage for industry players lies in recognising that their investment priorities must be balanced not only in the adoption of advanced technologies, but also in coordination tools, narrative re-semantisation, and environments that make circularity attractive and functional.The study acknowledges a significant methodological limitation as the sample consists of three organisations operating in Northern Italy. This territorial limitation means that the results cannot be generalised and leaves open the possibility that the dynamics may have different outcomes in other territorial contexts, as the characteristics of relational governance and productive roots may take other forms. Furthermore, the study focuses on the perspectives of circular intermediaries (platforms, tech providers, transformers), which means there is not an equally direct representation of the perspectives of more traditional manufacturing companies and end consumers. However, despite these limitations, the research puts forward a critical argument: the issue of circularity in the Italian fashion industry is not, in reality, a technical or regulatory problem, but rather an organisational and cultural one. The three case studies demonstrate that if the idea of circularity is developed as an integrated system that includes decentralised, coordinated infrastructure elements, narrative structures that legitimise the value of recycling, and processes that integrate craftsmanship and innovative elements, then it is not only possible but also desirable. In the Italian context, where the fragmentation of the sector into small and medium-sized enterprises, territorial entities and localised knowledge is a structural reality, the design of circularity can actually take advantage of this heterogeneity, in contrast to standardisation, which eliminates particularities, and instead focus on infrastructural and narrative projects that maintain the autonomy of the various actors and provide cultural legitimacy to the practices of transformation and longevity of materials. From this point of view, in fact, the very historical elements of the Italian production system, such as fragmentation, territoriality, and multiple scales and skills, can represent an opportunity to develop innovative solutions in tune with the sector's identity, rather than an obstacle to the realisation of circularity. In this sense, in the Italian fashion sector, circularity could find paths of implementation more consistent with the local productive fabric if conceived as innovation co-designed with local actors, rather than as external regulatory compliance.

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CAPTION

[Tab. 01] Summary of the characteristics of the organisations and micro-enterprises surveyed.

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DIGITAL AND INTERACTIVE PLATFORMS AS NETWORKING AND DATA-SHARING TOOL

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Abstract

The paper investigates the evolution of digital platforms as complex socio-technical ecosystems focused on data visualization, exploration, and the mediation of social and informational networks. Adopting an interdisciplinary perspective, the study analyzes how platforms reshape the production, consumption, and circulation of digital content, as well as the management of social relationships. Through a critical reading of the transition from the participatory web to contemporary platform models, the paper highlights how platforms are not only technological infrastructures, but also cultural devices capable of shaping practices, transferring information, and managing content. The research is based on a comparative analysis of case studies grouped into four categories: Low Impact, Accessibility and Inclusion, Data Exploration and Visualization, and Algorithms and AI. This analysis highlights recurring design models and opportunities, with particular attention to modes of information exploration, and characteristics related to sustainability and platform usage. Within this framework, the paper explores the role of co-design practices as a methodological approach for testing and validating platforms. By actively involving users, stakeholders, and communities in the phases of ideation, prototyping, and evaluation of UX and UI, co-design supports more responsive and inclusive design processes. Finally, the paper proposes a set of pre-design requirements and parameters for developing accessible, low-tech, and environmentally responsible platforms that promote economic sustainability and broaden access to digital content, fostering more inclusive and conscious digital ecosystems.

Keywords: *Digital Platforms, Digital Ecosystem, Design Guidelines, Fashion Stakeholders, Web 3.0*

INTRODUCTION

The evolution of digital platforms within the fashion ecosystem reflects broader transformations in Information and Communication Technologies (ICT) and the progressive shift toward more interconnected and service-oriented paradigms. From the early participatory web – characterized by promises of democratization, user-generated content, and peer-to-peer collaboration – to contemporary platform-based architectures dominated by centralized governance and data-driven business models, digital infrastructures have evolved through distinct phases marked by the emergence of increasingly sophisticated technological frameworks (Srnicek, 2017).
The Internet of Things (IoT) has introduced pervasive sensing capabilities and object connectivity, enabling physical garments, retail spaces, and supply chain components to generate and exchange data in real-time (Pal & Yasar, 2020). Fashion brands have begun embedding RFID tags, NFC chips and blockchain technology in apparel manufacturing to track inventory movement, authenticate products, and gather data on consumer usage patterns, as exemplified by luxury brands like Burberry and Moncler, which have integrated smart tags to enhance both supply chain transparency and customer engagement (Bertola & Teunissen, 2018; Sun & Ha-Brookshire, 2025).
The Internet of Services (IoS) has transformed software functionalities into modular, composable services accessible through standardized interfaces,

facilitating the development of distributed applications that coordinate multiple actors and processes (Reis et al., 2022).
More recently, the Internet of Everything (IoE) framework has expanded these paradigms by envisioning comprehensive connectivity among people, processes, data, and objects, creating intelligent networks where value emerges from the convergence and orchestration of heterogeneous elements (Farias da Costa et al., 2021).
Within the fashion industry, these technological shifts have fundamentally reconfigured the relationships between designers, manufacturers, retailers, and consumers, disrupting traditional hierarchies and enabling new forms of data circulation, collaborative practices, and value creation (Rocamora, 2017; Casciani et al., 2022; Glogar et al., 2025; Liu & Liu, 2025).
While seminal studies about "Web 2.0" emphasized user-generated content and collective intelligence, embodying an optimistic vision of participatory culture, recent research has theorized digital platforms as enablers of new forms of civic engagement and creative expression, as cultural diapositives. In fashion, this manifested through fashion blogs, street style photography platforms, and early social media communities that democratized fashion discourse beyond traditional gatekeepers (Rocamora, 2011). However, this early enthusiasm has been progressively tempered by critical scholarship that interrogates the power dynamics embedded within platform architectures.

Van Dijck, Poell, and de Waal (2018) introduced the concept of "platform society", arguing that platforms have transcended their status as mere technological tools to become foundational infrastructures that penetrate and reorganize social institutions. In the fashion sector, this transformation is particularly evident: platforms like Instagram, TikTok, and Pinterest have fundamentally reconfigured fashion communication, consumption patterns, and brand-consumer relationships (Duffy & Hund, 2015). Platforms now mediate not only how fashion is discovered and consumed, but also how trends emerge, how cultural capital is accumulated, and how fashion labor is organized. Plantin et al. (2018) further complicated this understanding by examining the convergence of platforms and infrastructures, demonstrating how platforms increasingly assume infrastructural characteristics while traditional infrastructures adopt platform-like features, creating hybrid socio-technical assemblages that now underpin the entire fashion ecosystem.

This transformation can also be interpreted through the concept of *remediation*, as theorized by Bolter and Grusin (1999), whereby digital media refashion and reconfigure the logics of pre-existing media forms. Contemporary fashion platforms absorb and reorganize communication systems within layered digital environments. In this way, platforms become cultural interfaces that translate visual culture, practices, and research knowledge into interactive, data-driven ecosystems.
Within the fashion system, this process marks a shift from representation to interaction, from linear communication to participatory infrastructures, and from product-centered logics toward relational and knowledge-based value creation.
Gillespie's (2010) analysis of the "politics of platforms" reveals how these entities strategically position themselves as both open and closed, neutral and interventionist, depending on regulatory and commercial contexts. This discursive flexibility obscures the extent to which platforms actively curate, moderate, and algorithmically organize information flows.
In fashion, this is particularly consequential: Instagram's algorithmic feed determines which designers gain visibility, TikTok's recommendation system shapes viral fashion trends, and Pinterest's visual search algorithms influence consumer taste formation (Rocamora, 2017; de Perthuis & Findlay, 2019).
In such a perspective, digital platforms have become pivotal mediators in this transformation, functioning as spaces where creative labor is coordinated, trends are identified and disseminated, consumer preferences are aggregated and analyzed, and brand identities are constructed and negotiated (Duffy, 2017). Platforms leverage artificial intelligence and social media monitoring to predict emerging trends by analyzing millions of images and posts, fundamentally altering how fashion companies approach design and merchandising cycles (Bof & McKinsey, 2019, 2025). Similarly, many brands like Zara have developed sophisticated digital infrastructures that connect point-of-sale data with design teams in real-time, enabling rapid response to consumer demand and reducing unsold inventory.

Intelligent data processing has provided the technological foundation for platforms that transcend simple communication functions to operate as complex socio-technical ecosystems. These ecosystems are capable of mediating knowledge exchange across distributed communities, orchestrating global production networks, visualizing complex datasets, and actively shaping cultural practices and consumption patterns (Van Dijck et al., 2018; Plantin et al., 2018).

In the fashion domain specifically, platforms have emerged as critical infrastructures that serve multiple, often overlapping functions: visualizing and interpreting trend data through sophisticated dashboards and analytical tools, coordinating intricate supply chains that span multiple continents and involve numerous intermediaries, facilitating peer-to-peer exchange of garments and accessories in circular economy models, providing spaces for community formation and knowledge sharing among practitioners and enthusiasts, and constructing compelling brand narratives through curated visual content and strategic algorithmic amplification. Platforms like Depop and Vinted have created thriving marketplaces for second-hand fashion, attracting millions of users and challenging traditional retail models while promoting circular consumption practices. Meanwhile, supply chain transparency platforms such as Provenance, an AI-enabled product data platform, and TextileGenesis, which delivers article-level traceability by creating digital tokens for every step in the supply chain, utilize blockchain technology to trace materials from fiber to finished garment, responding to growing consumer demand for ethical and sustainable production—a practice adopted by brands including Stella McCartney and Reformation (Agrawal et al., 2021; Cedrola et al., 2024). Professional networking platforms like The Business of Fashion's community forums and design collaboration tools such as CLO 3D and Browzwear enable distributed teams to work synchronously on digital prototypes, significantly reducing sample production and associated waste, and help fashion companies speed up time to market, improve fit, increase customer satisfaction. Moreover, digital fashion agencies and mono or multi-brand digital platforms build collaborative communities of experts with different digital competencies, sharing knowledge in such open-source communities (Casciani et al., 2022).

This multifaceted role has transformed traditional industry structures, enabling new modes of creative production that blur boundaries between professional and amateur practice, new consumption patterns that emphasize access over ownership, and new forms of cultural intermediation that challenge established gatekeeping mechanisms (McRobbie, 2016). However, these transformations have also introduced significant tensions and challenges: issues of precarious work and value extraction, concerns about data privacy and algorithmic bias, questions regarding environmental sustainability and the material costs of digital infrastructures—including the substantial energy consumption of data centers supporting e-commerce operations—and debates about accessibility and digital exclusion (Crawford, 2021).

DIGITAL ECOSYSTEM: CASE STUDIES SELECTION

In an increasingly internet-based society, the ways in which people access information, communicate, and interact have undergone radical changes, reshaping behaviors, tools, and languages, and fostering the pervasive spread of technological platforms. The digital era has introduced growing levels of interactivity and personalization within platforms, transforming the processes of production, transmission, and sharing of knowledge.
Since the introduction of infographics, information design, and data visualization, design has engaged with the management of complex data flows through new media, developing alternative ways of accessing and experiencing information.
Within this scenario, theories of complexity (Morin, 2017; Bocchi & Ceruti, 2020; Ceruti & Bellusci, 2025) have provided a framework for interpreting the non-linear nature of contemporary digital phenomena, emphasizing relationships, interdependencies, and the definition of systems capable of making complex data understandable. Design thus assumes a key role in the processes of knowledge production and dissemination, operating through the construction of alternative languages to convey information and to structure new forms of knowledge representation, while also responding to the needs of sustainability, circularity, and accessibility in the digital world. Digital platforms, therefore, emerge as environments in which information is not

simply transferred but constructed through processes of interaction, visualization, and shared interpretation.
They are situated within the *docusphere* (Ferraris, 2021), understood as the overall ensemble of documents and human behaviours, regardless of their immediate informational value. This differs from the *infosphere* (Floridi, 2017), which represents the surface layer of information. "[…] The infosphere is the superficial and particularly murky foam of a much vaster sea, which I define as the '*docusphere*', consisting in the domain of documentality" — "[…] the web is only minimally an infosphere and largely a *docusphere* and a biosphere" (Ferraris, 2021, pp. 41, 310).

The *docusphere* highlights the tensions between recording and meaning-making, proposing a more complex vision of digital knowledge, in which design can act not only as a communication medium, but as a device capable of mediating and interpreting this stratification in an intelligible way. At the same time, digital transformation has introduced systems of automation and dematerialization that have redefined the timing, spaces, and modalities of communication. Internet can be understood as a "universal meta-platform, neutral, multi-sided, and multi-layered" (Cellini, 2018), within which multiple specialized platforms coexist and interconnect. Platforms can be read as complex ecosystems oriented toward the sharing of information, data, and services, capable of facilitating different types of interaction and access to content.
In this context, new technologies have contributed to breaking down temporal and geographical barriers to communication and connection. The development of services, tools, and classification systems has facilitated access to information and knowledge, strengthening the role of platforms as devices of cognitive mediation.
From this perspective, the selection and analysis of the case studies presented outline a theoretical framework that provide a critical reading of platforms representative of the main orientations in contemporary design practice. The definition of four categories — *Low Impact, Accessibility and Inclusivity, Data Visualization and Exploration, and Algorithms and AI* — highlights how different configurations of digital ecosystems reflect specific visions that guide design practices.
The identification of these four categories is based on a hybrid methodological approach, that combines theoretical grounding with inductive observation. On the one hand, they are based on literature on platform studies, digital design, and data culture; on the other, they emerged through a comparative analysis of contemporary digital platforms, whose design strategies reveal recurring orientations in how digital ecosystems are conceived and developed.
These categories are not isolated typologies but should be considered as interconnected analytical dimensions that may coexist within a single platform. Together, they form a conceptual framework for interpreting how platforms articulate environmental responsibility, inclusivity, knowledge mediation, and algorithmic agency.
The research initially considered a broader set of platforms identified through exploratory mapping of contemporary digital ecosystems. From this broader analytical sample, the cases discussed in the paper were selected as best cases, chosen for their representativeness and clarity in expressing the design approach outlined above.
The *Low Impac*t category includes platforms that promote technologies, practices, and design choices oriented toward ecological and social sustainability, emphasizing the reduction of energy footprints, technological autonomy, and shared responsibility. An example is the website *Low-tech Magazine – Solar Low-tech Power*; powered by solar energy, it displays the available energy through a battery indicator on the page, informing users that the website may go offline in case of insufficient energy [Fig. 01].

Located in Barcelona, it is therefore closely connected to local weather conditions and shows live data relating to power supply, power demand, and energy storage. It is a blog that explicitly presents a model in which the digital platform becomes a space for sharing information. To reduce energy use, the designers opted for a back-to-basics web design, using a static site instead of a database-driven content management system. They further apply default typefaces, dithered images, offline reading options, and other strategies to reduce energy use far below that of the average website. In addition, the low resource requirements and open design help keep the blog accessible for visitors using older computers and/or less reliable internet connections. In this case, all design choices are oriented toward adopting a low-tech model as a

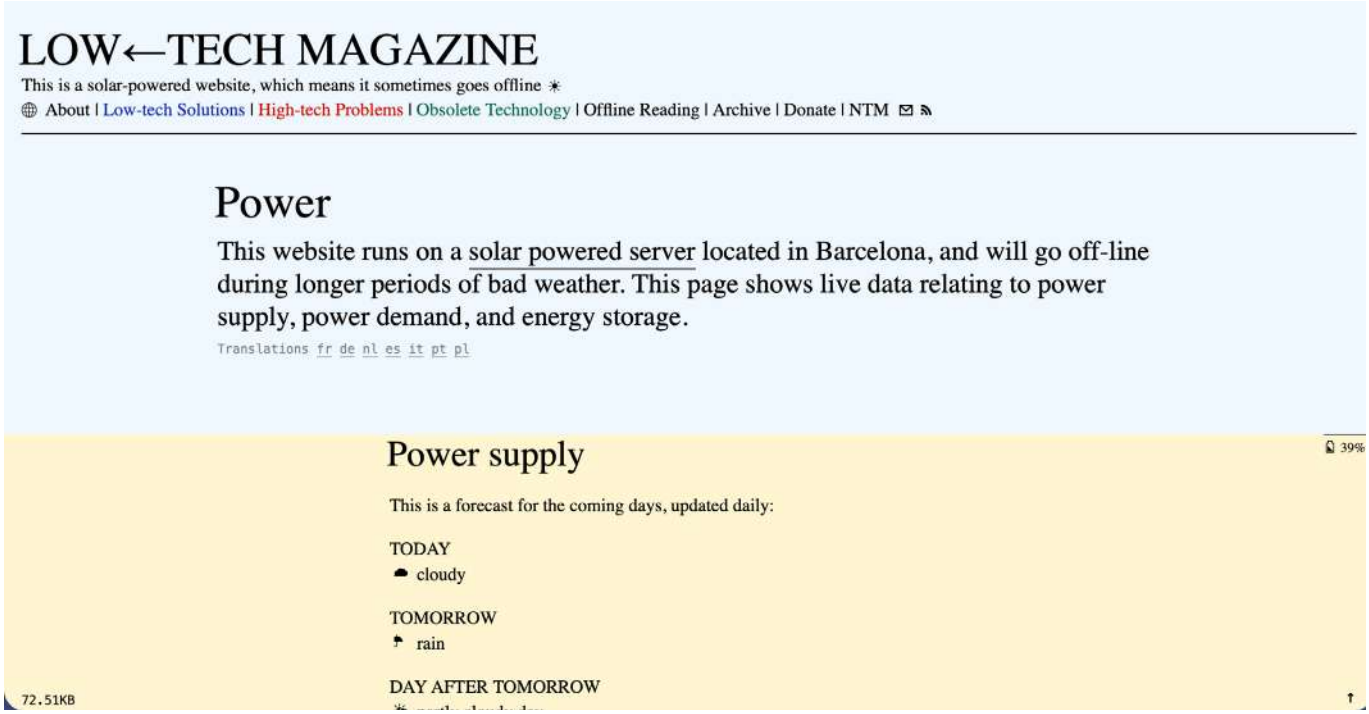

Fig. 01

critique of highly sophisticated new technologies. The design studio *Formafantasma* uses the digital platform as an extension of their research-based design practice. The exhibition-oriented approach of its portfolio becomes a device for a critical reflection, in line with their vision. The website has been designed to minimize the energy consumption and CO_2 emissions resulting from internet navigation. The interface uses system typefaces (Arial and Times New Roman) to avoid unnecessary HTTP requests and is available in dark mode, following the operating system's color scheme preferences by default, thereby reducing screen brightness and energy consumption – especially in mobile use, where OLED screens are most common.
Interface clarity is not merely an aesthetic choice, but a strategy to limit the loading of unnecessary content. The preview of file sizes before enlarging images makes the energy cost of user actions explicit, introducing a form of shared design awareness between platform and user. At the infrastructural level, the adoption of renewable-energy-powered hosting, such as GreenGeeks, together with a custom-developed platform, further contributes to reducing the environmental impact on the server side.
The *Accessibility and Inclusivity* category includes platforms that integrate accessibility services and broad user engagement as core design principles in web use. In particular, the University of the Arts London (UAL) integrates accessibility tools directly into its institutional website through *ReciteMe* technology, which provides translation, text-to-speech, typographic adjustment, text highlighting, and other interface adaptation functions, making content accessible to users with diverse accessibility needs [Fig. 02].

Another AI-based technology is *accessiBe*, which aims to make websites accessible for people with visual, auditory, and motor disabilities through automated processes that analyze and correct content to comply with WCAG guidelines.
The *Data Visualization and Exploration* category investigates platforms that transform data into visual systems that can be selected and navigated through structured storytelling. The design becomes a tool not only for aesthetic representation, but a practice for understanding complex phenomena and making knowledge accessible by designing ways of communicating data that embrace context, qualitative narratives, and even imperfections or missing information. This vision is embodied in *Data Humanism*, an approach that reclaims the human side of data and

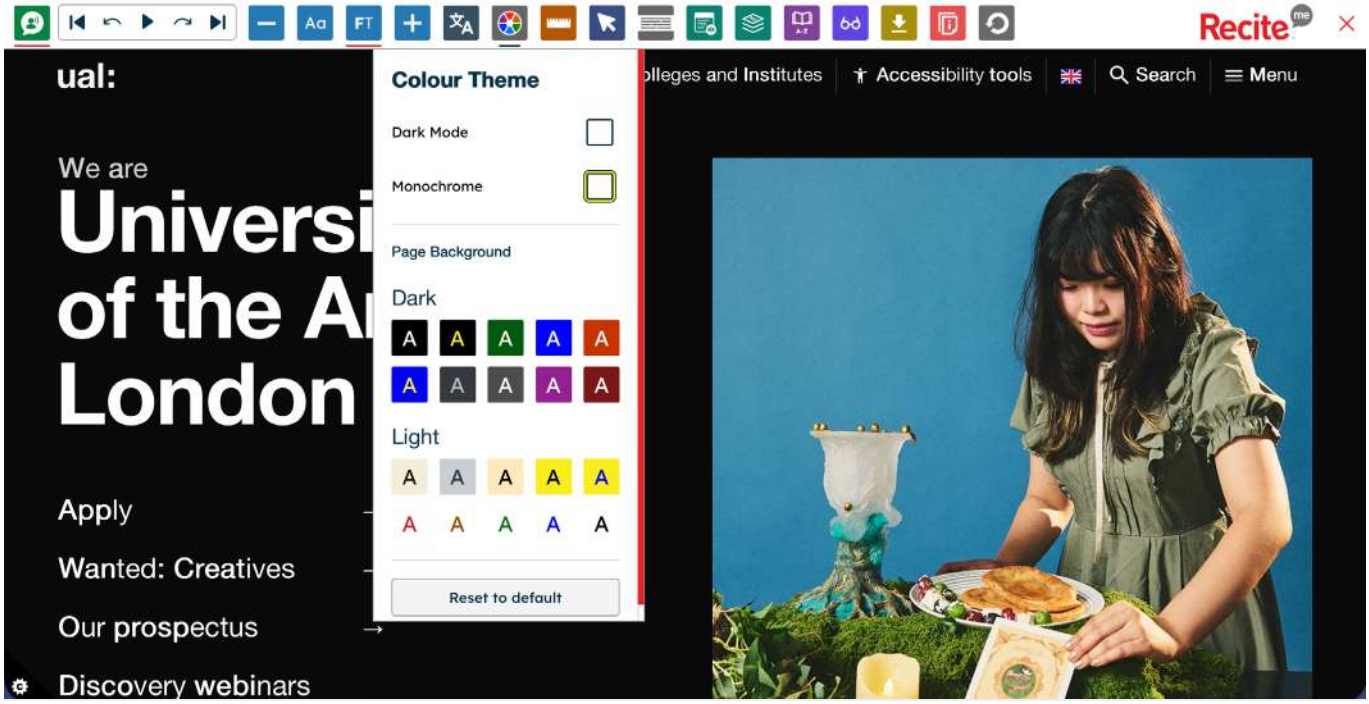

Fig. 02

recognizes that even the most technical datasets are rooted in human stories, actions, and decisions (Lupi, 2017).

Science Stack: Tools Within Reach by *Pentagram* is an interactive infographic for data visualization and comparison. The project aims to make the impact of low-cost and open-source scientific tools visible and accessible to a broad audience, showing how they are transforming research and society. It operates as an interactive module composed of 24 cards, each presenting a different tool and highlighting a key feature. The cards are organized into categories that allow users to explore, compare, and sort tools by type, use, cost, and level of openness. The project is designed to organize complex information into comparable visual forms. Its design value lies in creating interfaces that support the critical interpretation of multidimensional datasets, enhancing accessibility while reducing and clarifying complexity.

The *Impact Report* section of the *Organic Basics* clothing brand's platform presents data related to the social and environmental impacts of its products through accessible visualizations and indicators. The aim is to transparently communicate initiatives and ecological footprints not merely by publishing numbers, but through a visual storytelling that makes the connection between production, value chain, and impact legible. This demonstrates how design can facilitate access to complex information; at the same time, it remains an example of corporate transparency reporting – a marketing practice that risks oscillating between genuinely enabling information and brand-driven consumer loyalty strategies.

Finally, the *Algorithms and AI* category examines how algorithms and AI-based digital platforms are redefining decision-making processes, personalization, and automation, making users active participants in interaction.

The *Unmade* platform enables real-time customization of garments through algorithms that translate user choices into product configurations. Here, the digital ecosystem is not merely a production tool, but an agent of co-design between machine and user. The platform becomes a medium of interaction, intertwined with predictive models and algorithmic logic to enable more sustainable production (stock reduction and on-demand customization).

Moreover, *Browzwear* is an advanced 3D design platform for the fashion industry that digitizes and accelerates the product development process, reducing costs and waste through realistic virtual prototypes (true-to-life virtual twins). It integrates algorithms and AI to support collaborative design

and garment simulation, fostering sustainability. Positioned as a hub for digitizing the entire product development cycle – from concept to design, production, and sales – it synchronizes heterogeneous teams around a single digital model. The selected platforms demonstrate how principles of sustainability, accessibility, storytelling, and automation can be translated into concrete design choices aimed at facilitating access to information, reducing the environmental impact of digital systems, providing tools to access content through defined codes and narratives, and introducing intelligent systems capable of supporting design, management, and collaboration processes.

PRE-DESIGN PARAMETERS FOR WEB PLATFORM 3.0 DEVELOPMENT

In contemporary debate, Web 3.0 cannot be interpreted exclusively as a technological evolution, but rather as a set of orientations that redefine how digital platforms are conceived, governed, and used. Building on reflections on the *Semantic Web* (Berners-Lee et al., 2001), as well as subsequent developments related to artificial intelligence and to models of decentralization of infrastructure and governance of platforms, Web 3.0 is understood as a broader cultural and design shift.

Compared to Web 2.0 – characterized by the strong centralization of content, interactions, and data control within large proprietary platforms – Web 3.0 is described as an open, interoperable, and user-oriented digital environment, in which data, services, and relationships can be reused and reconfigured in flexible and distributed ways. From this perspective, the web is no longer conceived only as a space for publication or social interaction, but as an informational and relational ecosystem capable of supporting more articulated forms of cooperation between people, communities, and algorithmic systems.

Within this framework, defining a Web Platform 3.0 requires the identification of pre-design parameters capable of guiding design choices even before advanced technological solutions are introduced [Fig. 03]. Among these, low-tech approaches, environmental sustainability, and accessibility emerge as interdependent dimensions able to translate the principles of Web 3.0 into concrete design practices.

Low-tech, represents a first parameter, which is not intended as a rejection of innovation but as a conscious reduction of technological complexity. In the web domain, this approach encourages simple, durable, and energy-efficient solutions, promoting essential information architectures, optimized code, and limited use of computational resources. When applied to platform design, low-tech supports readability, maintainability, and content longevity, contributing to the creation of resilient systems capable of functioning under conditions of limited resources and adapting to diverse social, cultural, and geographical contexts.

Closely connected to this approach is the parameter of environmental sustainability, which has become increasingly central in discussions on web development. Recent studies show that the entire digital ecosystem – including network infrastructures, data centers, devices, and data flows – contributes significantly to global greenhouse gas emissions.

In response to these challenges, *Sustainable Web Design* approach proposes a vision of the web as a socio-technical infrastructure whose design must account for environmental impact across the entire lifecycle of digital platforms (Greenwood, 2021). Initiatives such as the *Sustainable Web Manifesto* and the *Web Sustainability Guidelines* promoted by the *World Wide Web Consortium* (W3C) emphasize the need to integrate energy efficiency, transparency, resilience, and social responsibility into design and development processes. Sustainability, therefore, extends beyond technical performance optimization to include governance models, access to content, and the distribution of value generated by digital platforms.

A third key pre-design parameter is accessibility, understood as a structural prerequisite rather than a mere regulatory requirement. Making platforms accessible means designing systems that can adapt to different sensory, cognitive, and linguistic abilities, ensuring equal access to information and knowledge. International standards such as the *Web Content Accessibility Guidelines* (WCAG) 2.1 issued by the W3C, together with the European regulatory framework defined by the *European Accessibility Act* (EAA), provide shared principles and criteria for building content that is Perceivable, Operable, Understandable, and Robust (POUR).

From a design perspective, accessibility also contributes to reducing interaction complexity by fostering clearer, more navigable, and more understandable interfaces. In this sense, it aligns with low-tech and eco-design principles,

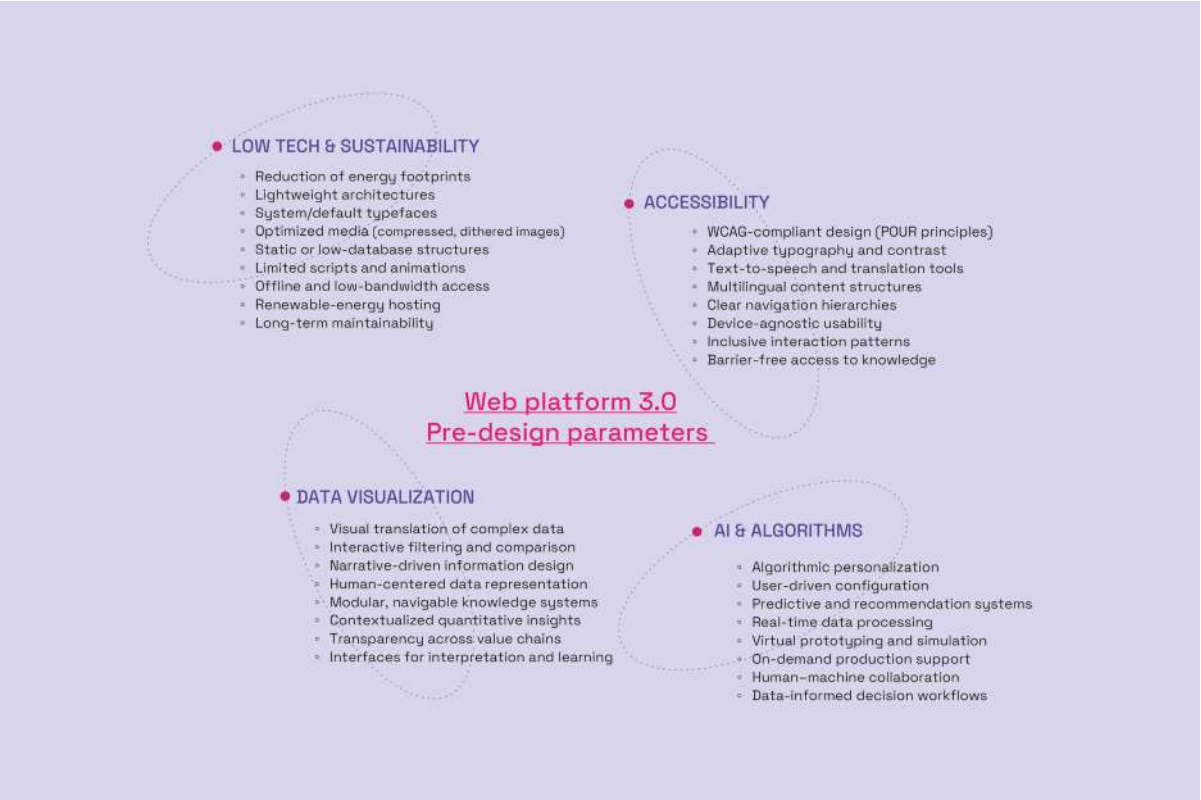

Fig. 03

reinforcing the idea of digital platforms as inclusive, cooperative spaces oriented toward social and environmental sustainability.

RHITA PLATFORM 3.0: A COLLABORATIVE DIGITAL FASHION SYSTEM

Building on the theoretical framework of platformization and socio-technical systems, the RHITA Platform 3.0[1] was conceived as a collaborative Web 3.0 environment for the fashion domain, aimed at sustainability, inclusivity, and sharing. A national network of five universities operating in Campania, Lombardy, Tuscany, and Veneto, focused on strengthening Italian Fashion know-how.

The platform was designed not merely as a repository of information, but as an interactive and dialogic space capable of connecting research outputs, sustainable practices, and stakeholders across the fashion value chain. The development phase included the construction of a research background based on the analysis of selected Web 3.0 visual platforms, with the objective of defining pre-design, functional and interaction parameters translating research findings into an advanced, interactive, and dialoguing platform.

This comparative investigation contributed to defining the technical and functional requirements of the RHITA web platform, including website architecture [Fig. 04], content organization, and the creation of interactive visualizations for structured dissemination of research outputs.
The platform was therefore structured according to four guiding criteria that reflect the analytical framework of this essay:

– a fashion-oriented perspective, addressing sector-specific dynamics of production and communication;
– a low-impact approach, prioritizing essential infrastructures, optimized content delivery, and sustainable digital practices;
– data visualization strategies, designed to make research findings accessible through visual and navigable knowledge systems;

1 RHITA Platform available at the link: https://www.rhita.eu

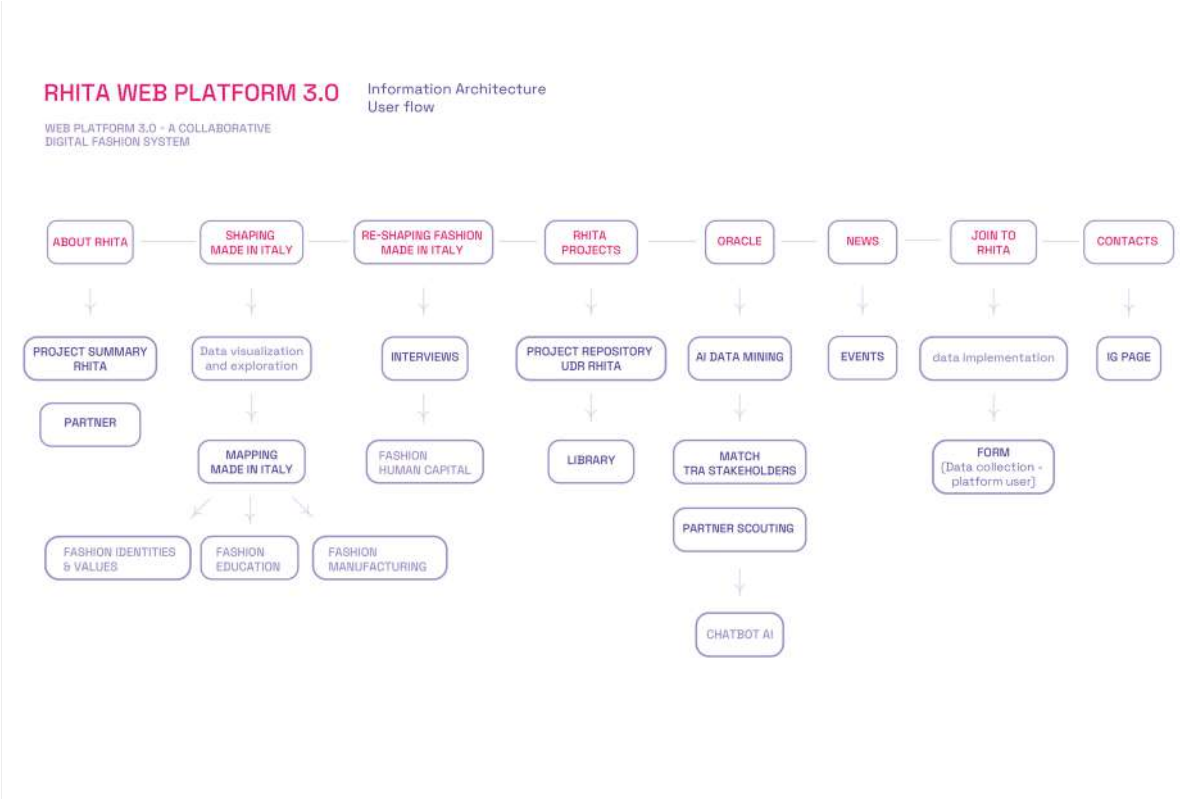

Fig. 04

– the integration of AI-based features, supporting investigation, customization, and search.

Through these principles, RHITA platform operates as a collaborative digital ecosystem that connects stakeholders – institutions, companies, researchers, and local actors – within a renewed fashion value chain. The platform enables collaborative exploration, knowledge exchange, and co-creation practices.

RHITA represents an experimental model for the evolution of fashion platforms from transactional environments toward narrative and operative tools based on research-driven, and oriented towards circularity, digitalization and sustainability.

CO-DESIGN PROCESSES FOR TESTING AND VALIDATING PLATFORMS

In the design and implementation of digital platforms, collaborative processes play a crucial role in evaluating usability and performance, and in providing feedback to developers before the digital tool's official launch.
Usability studies, focusing on the functional aspects of interfaces, the effectiveness of content, and digital communication strategies in general, allow us to verify and evaluate the user experience through experimental research phases.
Co-design is a creative and participatory practice that enables a wide range of actors to make meaningful contributions to the definition and resolution of complex problems. The term is commonly used as an umbrella concept encompassing approaches such as co-creation, open design processes, collaborative creative practices and participatory design. Across these perspectives, co-design is understood as a form of collaborative product and service development, as well as a process of joint value creation (Trischler, 2019; Guasch et al., 2022). Central to this approach is the active involvement of stakeholders and end users throughout the design and development process, with the aim of generating solutions that are closely aligned with their contexts of use. Within co-design processes, users are recognized as experts of their own experiences; their needs, practices, and concerns therefore become key drivers of decision-

making and design outcomes.
Co-design processes are adopted as a methodological framework for testing and validating digital platforms, integrating usability evaluation with participatory design practices (Sanders, Stappers, 2008). Within this approach, platform prototypes are subjected to iterative cycles of testing aimed at assessing both functional and experiential aspects of the interface, including clarity of visual elements, effectiveness of functionalities, and coherence of user flows.
Testing activities involve small, representative groups of participants – aligned with the target users of the platform –, and are conducted through a combination of focus groups and one-to-one interviews in order to collect qualitative feedback. Participants are guided through predefined tasks that simulate real usage scenarios by using an interactive prototype to test the User Interaction (UI) and User Experience (UX) while verbalizing their thoughts and decision-making processes according to a "think-aloud protocol" (Mcdonald et al. 2012). Feedback is systematically collected through open dialogue and structured questionnaires combining quantitative ratings and open-ended questions.

This method enables the observation of user behavior, the identification of strengths and critical issues, and the validation of navigation paths, interface components, and content structures.
In addition to functional testing, the co-design process includes the evaluation of graphic and visual aspects – such as layout, color schemes, typography, icons, and interface controls – to ensure usability, accessibility, and visual coherence.
The process is organized into a sequence of recurring activities – exploration of users' practices and processes, interface and functionality testing, feedback collection, and content refinement – which together support continuous improvement of the platform.
Insights gathered during each testing session inform successive design iterations, allowing incremental refinements to navigation, visual hierarchy, instructions, and interface elements.
This co-design-based testing framework is replicable and scalable, as it can be applied across different user groups, disciplinary backgrounds, and contexts, progressively expanding the diversity of participants involved and strengthening the robustness, inclusiveness, and validity of the platform. Within the RHITA project, co-design was adopted as a structuring principle guiding the platform's development. Workshops and testing sessions involved designers, researchers, and stakeholders in evaluating how sustainability criteria, accessibility features, and data visualization strategies could be effectively translated into digital interaction.
The participatory process allowed the platform to evolve iteratively, aligning technological development with cultural and operational needs of the contemporary fashion ecosystem.

CONCLUSIONS

The paper explored digital platforms in the fashion ecosystem as complex socio-technical infrastructures rather than neutral technological tools. Moving from early participatory paradigms to contemporary platform societies, the analysis has shown how platforms reorganize creative work, cultural mediation, data circulation, and value production. Through a comparative analysis of case studies organized into four distinct categories – Low Impact solutions that prioritize environmental and social sustainability, Accessibility and Inclusion services that extends the use to a wider audience, Data Exploration and Visualization tools that enable interpretive engagement with complex information, and Algorithms and AI-driven applications that automate decision-making and generate creative outputs – the essay demonstrate that platforms can actively mediate knowledge, reduce environmental impact, support inclusive access, and enable new forms of co-design and collaboration. Rather than acting only as interfaces for information delivery, platforms emerge as cognitive and cultural devices that structure meaning-making processes, visual storytelling, and collective visions. Particular attention is devoted to value dynamics within platform ecosystems, examining how economic worth is generated, captured, and distributed among multiple stakeholders; information exploration models that shape user engagement, investigating the affordances and constraints of different interface paradigms and interaction designs; and sustainability characteristics that determine environmental and economic viability, assessing both the ecological footprint of digital operations and the longevity of platform business models.
Furthermore, the research examines co-design practices and methodologies employed in platform

testing and validation, emphasizing the active involvement of diverse user groups, stakeholders, and communities throughout ideation, prototyping, and UX/UI evaluation phases.
Iterative testing and participatory feedback transform platforms into adaptive systems, capable of responding to diverse practices and expectations while strengthening their social legitimacy. This participatory dimension is crucial for ensuring that platforms respond to authentic needs, accommodate diverse literacies and competencies, and foster genuine agency rather than imposing predetermined interaction patterns. Fashion companies adopt co-creation platforms that invite consumers to participate in product design and customization, transforming customers from passive recipients into active contributors to creative processes.

Ultimately, this interdisciplinary investigation – drawing on insights from design studies, platform studies, media theory, and sustainability research – establishes a framework of pre-design requirements and parameters understood as interconnected orientations capable of guiding design before technological implementation
By situating RHITA as an applied case, this research suggests that fashion currently occupies a transitional stage in the evolution of digital platforms, moving from communication-driven Web 2.0 environments toward collaborative and knowledge-oriented Web 3.0 ecosystems.
The study highlights how future fashion platforms may evolve by integrating sustainability metrics, participatory design, and data transparency directly into their infrastructures, addressing current systemic tensions within the industry, including overproduction, opacity of supply chains, and the concentration of information within platforms.
In this perspective, digital platforms can contribute to redefining whether fashion can become truly democratic, by enabling access to knowledge, participation in design processes, and shared cultural production. RHITA Platform therefore operates as a prototype of this shift, illustrating how digital infrastructures may support more inclusive, environmentally responsible, and collaborative models of value creation in fashion.

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CAPTIONS

[Fig. 01]. Low-tech Magazine – Solar Low-tech Power website page. Retrieved from: https://solar.lowtechmagazine.com/

[Fig. 02]. University of the Arts London; Accessibility tools on the UAL University website. Retrieved from: https://www.arts.ac.uk/

[Fig. 03]. Pre-design Parameters for Web platform 3.0. Image by Michela Carlomagno

[Fig. 04]. RHITA platform Information Architecture (IA). Image by Michela Carlomagno

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ROOTS & REACTIVATION

FASHION HERITAGE AND TERRITORIAL IDENTITIES AS FOUNDATION FOR RESHAPING

MAPPING CAMPANIA'S FASHION HERITAGE:

ARCHIVES AND MUSEUMS

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Abstract

The objective of mapping fashion heritage, highlighting its strengths and weaknesses in relation to ongoing transformations, as envisaged by RHITA for the Historical Research Unit of the University of Campania, requires a broad analytical perspective and the adoption of a specific critical framework of investigation. In this regard, on the one hand, the choice of a regional scale is considered appropriate in order to bring out differences in relation to the national context, in connection with the broader aim of enhancing local cultural heritage and strengthening the regional productive and manufacturing system. On the other hand, the need to observe regional museum and archival institutions through the lens of reshaping calls for a targeted approach which, beyond the analytical census itself, is able to identify exemplary cases that respond to contemporary change through heritage marketing and fashion heritage policies and projects. On these premises, the contribution presents the results of the comparative investigations conducted and proposes a revision of the criteria traditionally adopted for the census of fashion archives and museums, emphasising the value of those historical institutions active in Campania which, while preserving their identity and values, have updated themselves in accordance with the cultural demands of the present.

Keywords: *Fashion Heritage, Fashion History, Fashion Archives and Museums, Campania region, Made in Italy*

INTRODUCTION

Among those who closely follow current debates on fashion, it is now widely acknowledged that fashion archives and museums play a crucial role in the everyday life of the sector. From the most familiar perspective, the past documented in these "repositories" of memory acquires a strategic significance, since, in the face of the pressures exerted by globalization, 'the value of a brand's roots and identity has become a key factor for success […]; the strategic role of brand heritage, the historical soul of a label, strengthens its prestige and fuels its desirability' (Gnoli, 2025, p.1). In short, heritage enables companies to differentiate themselves within the market and to relaunch their brands.

On the creative and productive front of a company, where the proactive vision of the creative director prevails, the accumulation of projects and documents becomes a working archive from which to draw stimuli, forms and compositional solutions coherent with the brand's DNA. The connection sought with the company's own past ensures that brands remain at the forefront while remaining, at least formally, anchored to their historical image. This is how, as is well known, Daniel Roseberry has worked for Schiaparelli, Tom Ford for Gucci, Karl Lagerfeld for Chanel, Pier Paolo Piccioli for Valentino, and many others (Morini, 2010; Gnoli, 2012; Fabbri, 2021). As a device capable of triggering new creative processes, the archive provides concrete references for re-

editions, collections imbued with quotations and reinterpretations of historical lines, and even the straightforward re-presentation of "iconic" garments, according to a strategic and highly functional use of archival heritage. The material retrieval of garments from the past has likewise become a common practice among luxury brands, supporting policies conceptually close to the principles of the circular economy, favoured by the high quality and uniqueness of these "historical artefacts" reintroduced onto the international stage. Similarly, the reuse of second-hand garments has spread as a practice of upcycling or simple reuse of pieces sourced not so much from corporate archives as from markets or private collectors' holdings (Fornaciari, 2022).

Opposed to the pressing demands of production, the fast rhythms of runways and social media, however, are the slower and quieter tempos of historical research, which see archives and museums as indispensable repositories of sources and documents for the advancement of knowledge—sources awaiting the generation of new stories and narratives by different authors. In this sense, the archives and collections preserved in museums open up to monographic or polyphonic narratives in response to specific critical questions or to the need to gain a deeper understanding of events that appear already well known. The historiographical contribution of archives to fashion history remains considerable, and the stimuli emerging from the current state of research on Italian fashion are manifold.

At the core of this epistemic need lies, in our view, the awareness that the Italian fashion system is nourished by multiple relationships and involves diverse sectors and economic activities; that the expression Made in Italy should not be understood merely as an indication of origin but, above all, as a cultural construction encompassing both the design process, from conception to communication, and the production process [Fig.01]. A historical approach to the study of Made in Italy regards it as a "synthetic concept" in which personal and collective histories, as well as creative, cultural, material and immaterial skills of the actors operating in a given territory, converge (Colaiacomo, 2006; Belfanti, 2019; Dellapiana, 2022). Along this line, a broad critical lens is required one that, through written, iconographic, oral and material sources preserved in archives,

Fig. 01

museums or within local communities, is able to frame fashion within a new value chain aimed at recognising differences, identifying the heritage of local cultures and, consequently, strengthening the segments that compose today's productive and manufacturing system. Such a comprehensive perspective is indeed essential when the objective is to return to scholars, institutions, companies and the wider community the complex stratification of skills that have flowed over time into the production of garments and accessories, and to demonstrate the ways in which the fashion system has been shaped by the territorial milieu in which it is rooted.

WHICH MUSEUM AND WHICH ARCHIVE FOR FASHION?

In light of the considerations outlined above, we feel it necessary first to raise a fundamental question: which archive and which museum for fashion? If fashion is understood as a complex and extraordinary phenomenon in which garments represent only the most visible aspect, a circular system deeply intertwined with time in both its past and future dimensions, then its interpretation

cannot be confined to clothes alone. Fashion is generally regarded as a 'social phenomenon consisting in the emergence, at a given historical moment and within a specific geographical and cultural area, of aesthetic and behavioural models (in taste, style and expressive forms) and in their gradual dissemination as increasingly broader groups conform to them, for whom such models function both as elements of internal cohesion and as markers of recognisability in relation to other groups' (Frisa, 2015, p.8). It may also be defined as 'the ensemble of everything related to clothing, from industry to the garments produced' (Sabatini, 2018). It thus becomes evident that its scope necessarily includes figures, objects and cultural domains far broader than those traditionally associated with garments and accessories, extending at least to fashion communication and encompassing photographic archives, libraries, private collections, film and television productions, and more. When material evidence no longer exists—as is often the case for consumer goods such as garments, subject to progressive disposal and only recently to a conservative attitude—indirect sources such as photography and print media become crucial in documenting significant aspects of fashion history. Similarly, when families preserve in private deposits garments or accessories linked to specific historical moments, events, ateliers or production techniques, how can their memory be recovered in the absence of publicly accessible documentation? What, then, is the real perimeter within which an investigation of the material and immaterial heritage of fashion can and should be conducted?
This raises further questions: to what extent is it legitimate to believe that fashion history has been written solely by legendary protagonists who were able to transform their initial success into corporate realities and sometimes to preserve its traces in the form of company archives? And to what extent have other, less visible figures—operating outside the dominant media spotlight—contributed through quieter and more isolated trajectories to sustaining manufacturing traditions, know-how and small-scale production, nonetheless integral to the creative strength of a place in terms of coherence, quality and cultural significance?

In practical terms, this implies the need to broaden the field of investigation to such an extent that it becomes difficult to delimit precisely, leaving to the responsibility of the scholar the choice of possible deviations from the traditional field of fashion studies, in the conviction that ignoring these connections would be reductive, if not misleading. Ultimately, which parameters should be defined at the outset of a study aimed at mapping Italian fashion archives and museums?

Once the preliminary functional distinction between creative-project-oriented operations, brand heritage or strategic vision, on the one hand, and cultural heritage actions, on the other, has been overcome, we believe that two main forms of delimitation are required: a geographical one, linked to the specific focus of the investigation, and a thematic one which, however, risks becoming almost unattainable if one wishes to avoid arbitrary exclusions. Within the articulated Italian geography—where a mosaic of cultural and creative resources is unevenly distributed between major cities and minor centres, corresponding to internationally relevant production districts as well as to secondary networks of production and consumption that have become sedimented within the national tourist imagination—the exploration of the country's creative fabric can be pursued at different scales and through different methodological approaches.

With regard to the area surrounding Naples, the regional dimension appears particularly appropriate for recovering the full knowledge of the sector's cultural DNA, making it immediately recognisable on the market and restoring its credibility and attractiveness. Such a broad perspective is essential when the aim is to return to scholars, institutions, companies and the wider community the complex stratification of competences that have accumulated in the territory over time, and to demonstrate how the fashion system has been nourished by the local *milieu* in which it is rooted. The Campanian archipelago has absorbed models from other contexts and reinterpreted them; it has exported designers and skilled labour across Italy and abroad; but it has also hosted figures capable of contributing autonomously to the composite chorus of Italian fashion through a syncretic fusion of craftsmanship, the reinvention of tradition, market dynamics, industry and tourism [Fig. 02]. Since the 1950s, when fashion emerged as a new driver of national growth and developed especially where strong productive traditions already existed, the city and its "mythical" surroundings—enriched by the extraordinary landscape heritage

Fig. 02

of the islands and coastal areas—have established themselves as the "capital of fashion in southern Italy" (Cirillo, 2017). Despite the difficulties inherent in the context, this role has persisted to the present day, providing, through the work of its masters, a non-marginal contribution to shaping the kaleidoscopic face of Italian fashion—one that must be retrieved by moving it away from an improper subordinate framing.

This is evident in places such as Capri, Ischia, Positano and Torre del Greco, where initiatives undertaken by external personalities together with local artisans, aimed at establishing manufacturing activities for commerce and tourism, have drawn on the history of these locations, becoming emblematic of a culture of making that ensures continuity with the past while demanding constant updating to contemporary conditions.

THE PREREQUISITES FOR MAPPING

ARCHIVES

Following this introductory framework, it is useful to clarify that the survey proposed in the present research—while necessarily remaining within a conventional understanding of what constitutes a fashion archive or fashion museum, since extending the thematic scope to photographic, bibliographic, and film archives would have broadened the field of investigation beyond the possibilities of this research unit—both inherits and updates previous work, integrating it with the outcomes of the most recent scholarship in the field.

In this respect, we consider it appropriate to adopt as a foundational reference the body of knowledge conveyed through the Portale degli Archivi della Moda (Fashion Archives Portal) developed within the SAN - Sistema Archivistico Nazionale (Italian National Archival System) and promoted by the General Directorate for Archives of the Ministry for Cultural Heritage and Activities, in collaboration with other institutional partners, with the aim of making the results of the project *Archivi della moda del '900 (20th-Century Fashion Archives)* accessible to a wide and heterogeneous audience, including non-specialists. Presented in 2009 and developed by ANAI - Associazione Nazionale Archivistica Italiana (Italian National Archival Association), the project enabled access to, knowledge of, and valorisation of a broad repertory of sources—previously largely unexplored—relating

to Italian fashion, including archival, bibliographic, iconographic, and audiovisual materials. It represents one of the most solid and enduring outcomes of the processes triggered by the 2003 UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage and by the new Italian Code of Cultural Heritage and Landscape issued in 2004 (Legislative Decree no. 42), aimed at activating forms of knowledge and safeguarding of these heritages not merely for promotional purposes, but also in defence of the inimitable identity of the national production system.

As explicitly stated on the portal's homepage, "the project is structured around the census of sources, the cataloguing and digitisation of materials contained in the archives of some of the most important Italian fashion houses, and the organisation of seminars and scholarly conferences." It is therefore a repertory comprising roughly ninety "protagonists" overall which, although specifically centred on the history and production of names and figures considered 'legendary', includes not only authoritative designers, tailors, and haute couture couturiers, but also a number of renowned journalists, collectors, costume designers, and industrialists active in the fashion world. Clearly, this survey is not exhaustive. Within it, approximately twenty "protagonists" are associated with Campania, particularly the province of Naples. This is a substantial number in relation to the total national sample—about ninety names overall—yet it still cannot be considered fully representative of the vast constellation of figures that shaped Italian fashion in the twentieth century. It nonetheless constitutes an excellent starting point for those who, like us, intend to map the heritage of Campanian fashion, highlighting strengths and weaknesses in relation to ongoing transformations by building on existing research tools. With specific regard to the producers of archival complexes, the platform's records include around twenty entities—tailors active in menswear (Taglialatela, 2010), fashion houses, boutiques, and department stores[1], also encompassing Capri, which is widely recognised as one of the most significant centres in the definition and development of Italian fashion during the twentieth century.

Research is always a work in progress, and its outcomes should never be regarded as definitive or complete. For this reason, beginning with the work carried out by this research group for the Campania Region in 2018–2019—aimed at producing a census of companies, archives, and "cultural landscapes" operating in the fashion sector and later integrated into the MODEC platform—we identified the need to broaden the survey to include additional names excluded from the ANAI project. This expansion involves not only other protagonists or producing entities we have addressed over time, but also the wider constellation of masters who have handled and constructed garments and accessories. Their testimonies, moreover, constitute an exceptional oral source for defining Campania's creative identity. This process led to the construction of an "archive of making"*(archivio del fare),* complementary to the archive defined by products and by iconographic and textual sources—together capable of outlining an articulated history that is still "legible" and, above all, more closely aligned with the complexity that fashion deserves.

In the polyphonic chorus of fashion, the contributions of artists and artisans, entrepreneurs and masters, photographers and graphic designers are intertwined. Each, with specific competences, and against the backdrop of economic, cultural, political factors and the evolution of taste and communication tools, has contributed to shaping Campania's creative identity[2]. In this sense, by integrating what was already present in the SAN census, the repertory has progressively expanded to include around twenty archives and a broader range of actors which, in addition to brands, also historic shops, production landscapes, foundations and manufacturing hubs. Among brands, to cite only a few significant examples, the survey highlights Amina Rubinacci, a leader in knitwear production; Giovanni Ascione & Figlio and Antonino De

1 Abla Fashion for Man, boutique Elena Wassermann, boutique Filippo Ferrandino, boutique La Parisienne, E. Marinella, Livio De Simone, M. Cilento & f.llo, Magazzini Italiani E &A Mele, sartoria Angelo Blasi, sartoria Antonio Panico, sartoria Caggiula, sartoria De Curtis, sartoria Fortunato Salviati, sartoria Francesco Ordine, sartoria Gaetano Caruso, sartoria Mario Formosa, sartoria Pasquale Sabino, sartoria Renato Ciardi, sartoria Roberto Combattente, sartoria Tullio Ciardulli, sartoria Visone).

2 The results of the work carried out by the research group of the University of Campania "Luigi Vanvitelli" (lead institution) for the project Critical Analysis and Strategic Guidelines for the Strengthening of the Fashion System in Campania (POR Campania 2014–2020), funded by the Campania Region and scientifically coordinated by Patrizia Ranzo, were published in Laboratorio Campania. Paesaggi produttivi e culturali della moda (ISBN 979-12-80178-44-2, Altralinea Editore, Florence, 2021).

Simone for the making of precious objects and coral; Campanile, Canfora, Deimille, Francesco Benigno, and Paolo Scafora for footwear; Omega, Tramontano, Mario Talarico, and Studio ROG for accessories; and Gianni Carità and Giannotti for jewellery. Each of these actors almost always possesses a body of documentation relating to company history, varying in richness and degree of organisation—often due to the historically limited value attributed to preserving traces of the past and, even more so, to the apparent ordinariness of the documents themselves.

Among these, an exception is represented by the Giovanni Ascione & Figlio archive, owing to the role of this Torre del Greco manufacture in the production and working of coral jewellery, which has been the subject of a recent inventorying initiative. A particularly prominent case is that of Mario Valentino, whose archive stands out for its integrity and variety of documentary media (administrative papers, sample books, patterns, drawings, tools and machinery, press clippings, publications, periodicals, communication materials, videos, haberdashery, as well as a very large number of products, including shoes and garments), yet lacks the systematic inventorying that would allow its formal inclusion among the archives of Naples' historic enterprises. The analytical study of the materials preserved within this archive enabled the author to reconstruct the intense creative and entrepreneurial trajectory of this Made in Italy excellence; however, today it struggles to become a tool with strong projective force capable of enhancing the brand's desirability due to the absence of such an approach in the company's current management (Cirillo, 2018). The economic investment required for proper archival preservation—through conditioning, inventorying, and ordering—has been replaced by basic rearrangement and by a formal closure to public consultation, as occurs in the majority of company archives, whether considered "virtuous" or not. As a consequence, this valuable heritage has become largely sterile with respect to its multiple potential vocations. The company activated the archive primarily for private purposes, underestimating the impact that an investment of resources aimed at sharing its rich preserved heritage could have had on strengthening its own identity, as was experienced on an isolated occasion of collaboration with a university research team (Cirillo & Liberti, 2015). This is a form of "private memory" that limits the possibility of updating the brand's creative and productive trajectory in accordance with the demands of reshaping. Consequently, Mario Valentino's cultural legacy remains partial, entrusted more to the monographic account than to the plurality of interpretations potentially contained within the archive.

A similarly singular situation can be observed in other historic Campanian companies such as E. Marinella, Isaia, or Kiton. Their long and fruitful histories do not correspond to the existence of equally consistent archives, since in several cases documentation relating to design choices, production techniques, and the individuals who worked within these companies has not been systematically preserved. Some state that they never gathered materials in a single location; others preserved them in a fragmented and episodic manner, to the point of renouncing the construction of a corporate historical archive, despite the recent "discovery" of its strategic value. As a result, the historical memory of certain Neapolitan companies that contributed to shaping Italian sartorial culture is often entrusted to indirect information—available in public institutional archives, in sectoral publications, or in valuable oral testimonies—which may be functional to a critical history of the sector but far less effective for brand heritage projects. A relevant example is the recent E. Marinella exhibition *Questa di Marinella è la Storia vera (The True Story of Marinella),* held in Sorrento in 2024 at Villa Fiorentino.

Comparing the Campanian situation with the national landscape, we necessarily recognise a significant gap with respect to the most advanced centres of northern Italy, where consolidated experiences of fashion heritage management, digital valorisation policies, and structured synergies between museums, companies, universities, and territories are more evident. One may think of Sistema Moda Milano, the Salvatore Ferragamo Historical Archive and the research centres in Tuscany, the textile districts of Brianza and Prato, or company archives such as Missoni, Max Mara, and Armani, which have developed consolidated practices of openness, digital cataloguing, educational programming, and sustainability. In relation to these realities, Campania occupies an intermediate position: it holds a central place within the commercial history of Italian fashion—

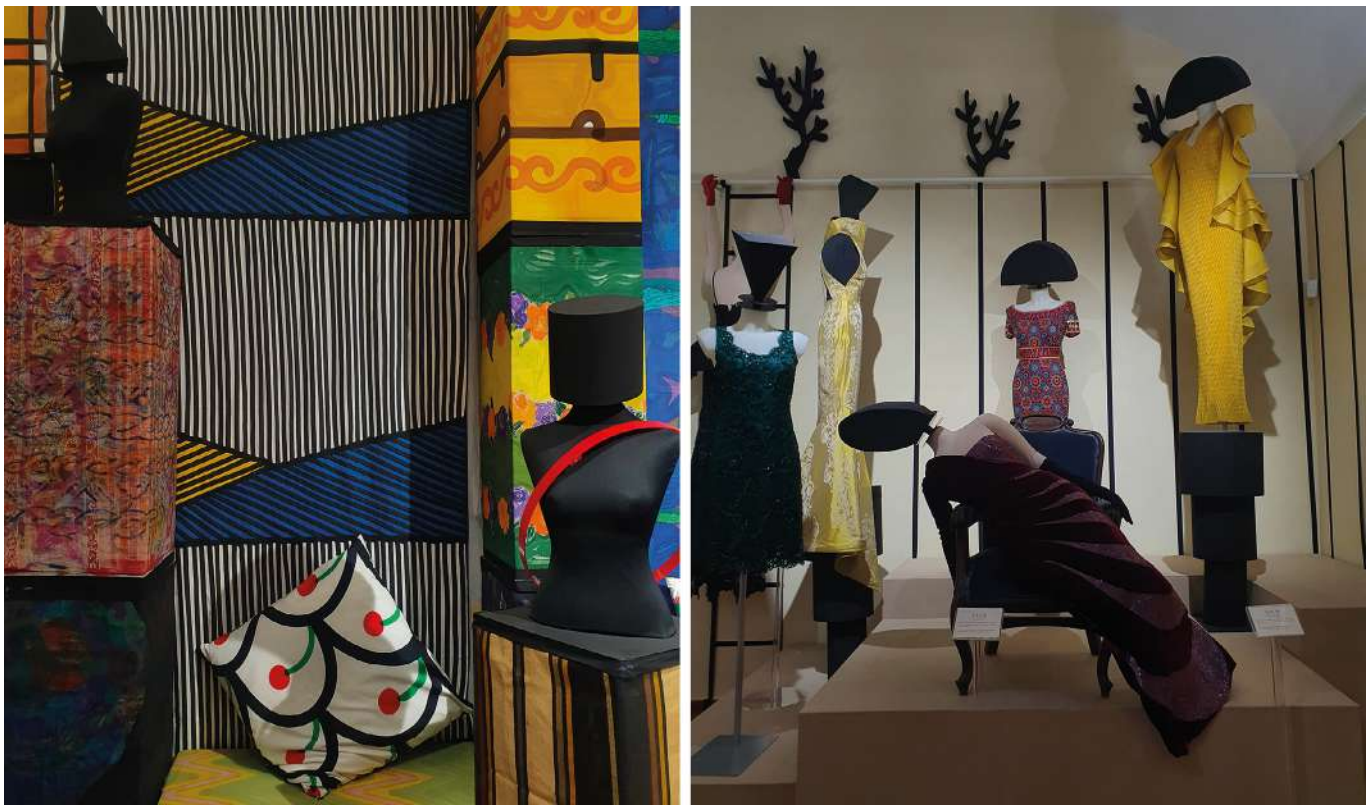


Fig. 03

often linked to entrepreneurial and creative trajectories of international relevance—yet it still suffers delays in the establishment of a fully developed heritage specifically dedicated to fashion heritage.

MUSEUMS

With regard to museums, the basic informational framework is provided by the census available on the platform of the Ministry of Culture, whose selection criteria took into account seven museums in Campania. These include not only institutions clearly and explicitly devoted to the theme—such as the Museo della Moda di Napoli (Naples Fashion Museum), the only museum in the region explicitly and permanently focused on fashion in the strict sense [Fig. 03]—but also those that more broadly preserve and document forms of production falling within this wide field of interests, such as costume, craftsmanship, and folklore, understood as documentary hubs of practices active until the mid-twentieth century from which distinctive regional productions and manufactures later developed. In this perspective, the survey extends to: the Museo civico *La gente senza storia* di Altavilla Irpina (Civic Museum "People Without History" of Altavilla Irpina, AV), which preserves nineteenth-century folk costumes and fine textiles from the first half of the nineteenth century, including printed cottons; the Museo etnografico *Beniamino Tartaglia* in Aquilonia (Beniamino Tartaglia Ethnographic Museum of Aquilonia, AV), with a section dedicated to clothing, dowries, and domestic furnishings; the Museo civico tessile e dell'arte contadina in Pontelandolfo (Civic Museum of Textiles and Peasant Art of Pontelandolfo, BN), devoted to textile production, especially wool, which supported a widespread domestic-loom system intensely used until the 1970s; the Museo civico del territorio in Cusano Mutri (Civic Museum of the Territory of Cusano Mutri, BN), which collects male and female folk costumes, original dowry pieces, linens and accessories, as well as tools for wool processing; and the Museo etnografico di Morigerati (Morigerati Ethnographic Museum of Norigerati, SA), documenting garments and artefacts characteristic of women's dowries in the local area. Finally, the Museo della seta (Silk Museum) at the Real Belvedere of San Leucio (CE) testifies to the articulated historical trajectory that, since 1789, has left in the Leucian territory a "silent" network of still-active silk mills.

Alongside this regional framework, a survey was carried out of nineteen museums at the national level that preserve or enhance collections of fashion and accessories. These institutions were taken as a comparative reference in order to assess similarities, differences, and levels of alignment with the most advanced practices in Fashion Heritage management.

Overall, the census describes a national picture that aligns closely with the well-known dynamics of fashion in Italy: regions such as Lombardy, Tuscany, Piedmont, and Emilia-Romagna can rely on a significant number of corporate museums, formally defined archives, and highly developed museum realities, reflecting their centrality in national industrial history or their role in generating Italian fashion's successes. Campania, by contrast, displays a more fragmented and fragile situation, despite the value and longevity of its sartorial and manufacturing traditions. The strength of "capital" cities such as Milan, Rome, Florence, and Naples has been defined within a widespread constellation of minor centres collectively involved in shaping the polyphonic chorus of Made in Italy. The evidence confirms the urgency of a critical and project-oriented intervention capable of identifying operational strategies for an integrated valorisation of regional fashion heritage in line with national and international standards. In Campania, therefore, the history of regional fashion—though extremely rich and of high quality—risks remaining incomplete if its critical reading and interpretation are not addressed through an articulated and complex process of source retrieval.

STRUCTURE OF THE FORM: ITEMS AND CONTENTS

The outcome of the previous reflections and of the targeted investigation conducted on Italian museum and archival institutions is the definition of an ideal record sheet for the census of fashion museums and archives, conceived as an operational tool sensitive to the themes of *reshaping* and applicable to any case across the national territory. To this end, the standard structure of the record has been developed on the basis of the guidelines issued by the General Directorate for Museums of the Ministry for Cultural Heritage and Activities, pursuing a necessary simplification consistent with the objectives of the present research. Institutional databases that analytically census museums and archives—such as the *Archivi del '900* platform and the Ministry of Culture website—indeed provide predominantly descriptive and highly synthetic information, without focusing on the tools and actions aimed at enhancing Italian fashion heritage, its ability to engage with contemporaneity, and the ways in which each institution documented in archival fonds or museum collections positions itself within the broader framework of *Made in Italy*. For these reasons, it was necessary to develop a survey form applicable to both museums and archives, allowing for minor differences, and to significantly expand the set of fields traditionally used in official censuses, which usually limit themselves to providing basic identification data, information on the size of collections or holdings, and elementary indications of accessibility. Conversely, for the purposes of this research, particular importance is attributed to fields relating to the "Cultural relevance with respect to the territorial context of reference", in which, with regard to the specific collections of the museum/archive, the artefacts and sources capable of providing elements of knowledge about the fashion and dress culture of the territory and its communities are described. This is by no means a marginal annotation, as it explicitly allows significant aspects and values of collections, documents or artefacts to emerge in the interpretation of their relationship with the *genius loci*. In the search for the variety and complexity of the features that characterise the Made in Italy, the identification of local specificities represents one of the necessary prerequisites for the updating of fully sustainable forms of production.
Another area of analysis concerns "Research, cataloguing and digitisation policies", which are essential for understanding both the level of accessibility and the capacity to build a shared heritage, given that many of these actions can only be implemented when specific funding and dedicated personnel are available for each type of activity. Similarly, research, cataloguing and digitisation require appropriate tools and equipment, without which the results of any potential actions risk becoming ineffective or outdated. Closely connected to these objectives is the "Relationship with cultural institutions in the territory": dialogue with public and private bodies, with key actors in the sector and, above all, with the communities to which the heritage belongs, represents one of the main directions promoted by UNESCO for national cultural institutions. The

impact of these relationships can be measured in terms of the capacity to engage audiences in cultural heritage enhancement programmes. "Heritage marketing and fashion heritage activities" today represent key indicators of how companies and museums update their practices in order to align with contemporary needs: recording their implementation and characteristics, also within the fashion sector, is useful for assessing the capacity of a museum/archive to act as a forward-looking or responsive interpreter of highly topical issues.

Dedicated attention must also be given to "Sustainability, inclusion and innovation". These themes, which are central to the RHITA project, are now an integral part of international guidelines for the management of cultural heritage and are considered essential parameters in the evaluation of the quality of institutions overseen by the Ministry of Culture. It was therefore deemed necessary to include a specific field capable of describing the methods and actions undertaken in this regard by the institutions under examination.

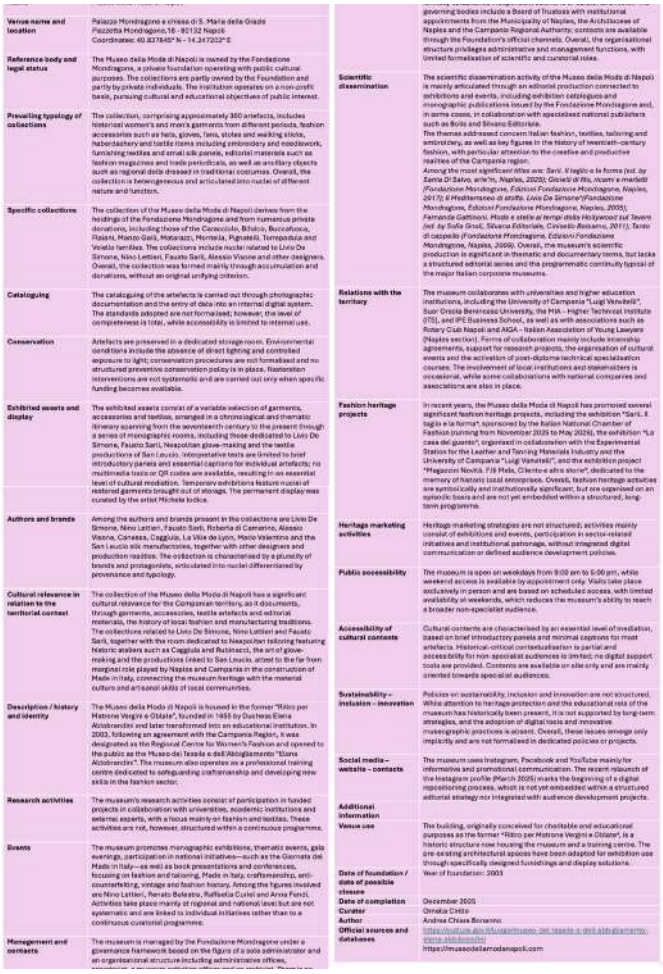
Finally, to complete the collection of data and information, a key point is devoted to the "Quality of cultural experience". This field does not assess cultural accessibility from a merely logistical point of view; rather, it refers to the ability of a museum/archive to offer up-to-date content, contextualised interpretations, accessible narratives and digital tools—that is, to demonstrate continuous improvement in its museological storytelling, both in terms of communication and of the transdisciplinary nature of its content. In this sense, the multidisciplinary and transversal nature of fashion lends itself particularly well to these approaches, enabling the institutions that hold such heritage to act as potential implementers of these practices. The implementation of these fields thus proved necessary in order to transform the record from a simple descriptive tool into an interpretative device, capable of critically assessing not only "what" is preserved in a museum or archive, but above all "how" it is managed, communicated and enhanced in accordance with the most current cultural frameworks.

TWO CASE STUDIES

By way of example, the research records were developed for two emblematic Italian case studies: the Museo Salvatore Ferragamo (Salvatore Ferragamo Museum) in Florence and the Museo della Moda di Napoli (Naples Fashion Museum). The selection of the Florentine museum is motivated by the exceptional nature of the institution, which represents one of the most advanced models of corporate museum practice at both national and international levels. It was recognised in November 2015 as the first green museum in Italy and officially joined ICOM (International Council of Museums) in November 2016. The second case was selected on the basis of its location within the geographical area of reference of the research unit.
The comparison thus sets, on the one hand, the strengths of a private institution linked to a highly prestigious historic company—both in the past and in the present—against, on the other, the sometimes virtuous yet at times fragile efforts of a recently established public museum. The availability of both economic and professional resources at the Museo Salvatore Ferragamo guarantees very high qualitative standards and continuity in initiatives dedicated to fashion heritage and sustainability, as well as the constant updating of cultural content within an intensive programme of activities. Conversely, the lesser financial stability and the more limited staff of the Museo della Moda di Napoli result in outcomes that are less exemplary, albeit appreciable in terms of the willingness to align with the best practices advocated by ministerial bodies and already implemented by pioneering institutions.

The structure of the form, as demonstrated by its exemplary completion [Fig. 04], allows not only the institutional history to emerge, but also crucial aspects such as the presence or absence of qualified professionals in the fashion sector, the degree of technological updating, the status of cataloguing, relations with local communities, the capacity to curate events, conferences and temporary exhibitions, and the ability to contribute to a contemporary narrative of fashion as cultural heritage.

The application of the record to the two emblematic case studies—the Museo Salvatore Ferragamo in Florence and the Museo della Moda di Napoli—made it possible to verify concretely the effectiveness of the tool and, above all, to reveal the conditions under which the main actors of Italian fashion heritage currently operate. The comparison between the two institutions, profoundly different in terms of institutional history, economic



Venue name and location	Palazzo Mondragone e chiesa di S. Maria delle Grazie Piazzetta Mondragone,18 - 80132 Napoli Coordinate: 40.837840° N - 14.247202° E
Reference body and legal status	The Museo della Moda di Napoli is owned by the Fondazione Mondragone, a private foundation operating with public cultural purposes. The collections are partly owned by the Foundation and partly by private individuals. The institution operates on a non-profit basis, pursuing cultural and educational objectives of public interest.
Prevailing typology of collections	The collection, comprising approximately 300 artefacts, includes historical women's and men's garments from different periods, fashion accessories such as hats, gloves, fans, stoles and walking sticks, haberdashery and textile items including embroidery and woodwork, furnishing textiles and small silk panels, editorial materials such as fashion magazines and trade periodicals, as well as ancillary objects such as regional dolls dressed in traditional costumes. Overall, the collection is heterogeneous and articulated into nuclei of different nature and function.
Specific collections	The collection of the Museo della Moda di Napoli derives from the holdings of the Fondazione Mondragone and from numerous private donations, including those of the Caracciolo, Bifulco, Buccafusca, Pisani, Manzo Gaeli, Matarazzi, Morniella, Pignatelli, Torrepadula and Vivaldo families. The collections include nuclei related to Livio De Simone, Nino Lettieri, Fausto Sarli, Alessio Visone and other designers. Overall, the collection was formed mainly through accumulation and donations, without an original unifying criterion.
Cataloguing	The cataloguing of the artefacts is carried out through photographic documentation and the entry of data into an internal digital system. The standards adopted are not formalised; however, the level of completeness is total, while accessibility is limited to internal use.
Conservation	Artefacts are preserved in a dedicated storage room. Environmental conditions include the absence of direct lighting and controlled exposure to light; conservation procedures are not formalised and no structured preventive conservation policy is in place. Restoration interventions are not systematic and are carried out only when specific funding becomes available.
Exhibited assets and display	The exhibited assets consist of a variable selection of garments, accessories and textiles, arranged in a chronological and thematic itinerary spanning from the seventeenth century to the present through a series of monographic rooms, including those dedicated to Livio De Simone, Fausto Sarli, Neapolitan glove-making and the textile productions of San Leucio. Interpretative texts are limited to brief introductory panels and essential captions for individual artefacts; no multimedia tools or QR codes are available, resulting in an essential level of cultural mediation. Temporary exhibitions feature nuclei of restored garments brought out of storage. The permanent display was curated by the artist Michele Iodice.
Authors and brands	Among the authors and brands present in the collections are Livio De Simone, Nino Lettieri, Fausto Sarli, Roberta di Camerino, Alessio Visone, Canessa, Caggiula, La Ville de Lyon, Mario Valentino and the San Leucio silk manufactories, together with other designers and production realities. The collection is characterised by a plurality of brands and protagonists, articulated into nuclei differentiated by provenance and typology.
Cultural relevance in relation to the territorial context	The collection of the Museo della Moda di Napoli has a significant cultural relevance for the Campanian territory, as it documents, through garments, accessories, textile artefacts and editorial materials, the history of local fashion and manufacturing traditions. The collections related to Livio De Simone, Nino Lettieri and Fausto Sarli, together with the room dedicated to Neapolitan tailoring featuring historic ateliers such as Caggiula and Rubinacci, the art of glove-making and the productions linked to San Leucio, attest to the far from marginal role played by Naples and Campania in the construction of Made in Italy, connecting the museum heritage with the material culture and artisanal skills of local communities.
Description / history and identity	The Museo della Moda di Napoli is housed in the former "Ritiro per Matrone Vergini e Citelle" founded in 1858 by Duchess Elena Aldobrandini and later transformed into an educational institution. In 2003, following an agreement with the Campania Region, it was designated as the Regional Centre for Women's Fashion and opened to the public as the Museo del Tessile e dell'Abbigliamento "Elena Aldobrandini". The museum also operates as a professional training centre dedicated to safeguarding craftsmanship and developing new skills in the fashion sector.
Research activities	The museum's research activities consist of participation in funded projects in collaboration with universities, academic institutions and external experts, with a focus mainly on fashion and textiles. These activities are not, however, structured within a continuous programme.
Events	The museum promotes monographic exhibitions, thematic events, gala evenings, participation in national initiatives—such as the Giornata del Made in Italy—as well as book presentations and conferences, focusing on fashion and tailoring. Made in Italy, craftsmanship, anti-counterfeiting, vintage and fashion history. Among the figures involved are Nino Lettieri, Renato Balestra, Raffaella Curiel and Anna Fendi. Activities take place mainly at regional and national level but are not systematic and are linked to individual initiatives rather than to a continuous curatorial programme.
Management and contacts	The museum is managed by the Fondazione Mondragone under a governance framework based on the figure of a sole administrator and an organisational structure including administrative offices,
	governing bodies include a Board of Trustees with institutional appointments from the Municipality of Naples, the Archdiocese of Naples and the Campania Regional Authority; contacts are available through the Foundation's official channels. Overall, the organisational structure privileges administrative and management functions, with limited formalisation of scientific and curatorial roles.
Scientific dissemination	The scientific dissemination activity of the Museo della Moda di Napoli is mainly articulated through an editorial production connected to exhibitions and events, including exhibition catalogues and monographic publications issued by the Fondazione Mondragone and, in some cases, in collaboration with specialised national publishers such as Bolis and Silvana Editoriale. The themes addressed concern Italian fashion, textiles, tailoring and embroidery, as well as key figures in the history of twentieth-century fashion, with particular attention to the creative and productive realities of the Campania region. *Among the most significant titles are: Sarli. Il taglio e le forme (ed. by Sarita Di Salvo, arte'm, Naples, 2020); Gioielli di filo, ricami e merletti (Fondazione Mondragone, Edizioni Fondazione Mondragone, Naples, 2017); Il Mediterraneo di stoffa. Livio De Simone/Fondazione Mondragone, Edizioni Fondazione Mondragone, Naples, 2005); Fernanda Gattinoni. Moda e stelle ai tempi della Hollywood sul Tevere (ed. by Sofia Gnoli, Silvana Editoriale, Cinisello Balsamo, 2011); Tanev di cappello (Fondazione Mondragone, Edizioni Fondazione Mondragone, Naples, 2009).* Overall, the museum's scientific production is significant in thematic and documentary terms, but lacks a structured editorial series and the programmatic continuity typical of the major Italian corporate museums.
Relations with the territory	The museum collaborates with universities and higher education institutions, including the University of Campania "Luigi Vanvitelli", Suor Orsola Benincasa University, the IMA - Higher Technical Institute (ITS), and IPE Business School, as well as with associations such as Rotary Club Napoli and AIGA - Italian Association of Young Lawyers (Naples section). Forms of collaboration mainly include internship agreements, support for research projects, the organisation of cultural events and the activation of post-diploma technical specialisation courses. The involvement of local institutions and stakeholders is occasional, while some collaborations with national companies and associations are also in place.
Fashion heritage projects	In recent years, the Museo della Moda di Napoli has promoted several significant fashion heritage projects, including the exhibition "Sarli. Il taglio e la forma", sponsored by the Italian National Chamber of Fashion (running from November 2025 to May 2026), the exhibition "La casa dei guanti", organised in collaboration with the Experimental Station for the Leather and Tanning Materials Industry and the University of Campania "Luigi Vanvitelli", and the exhibition project "Magazzini Novità. Fili Mels, Cilento e altre storie", dedicated to the memory of historic local enterprises. Overall, fashion heritage activities are symbolically and institutionally significant, but are organised on an episodic basis and are not yet embedded within a structured, long-term programme.
Heritage marketing activities	Heritage marketing strategies are not structured; activities mainly consist of exhibitions and events, participation in sector-related initiatives and institutional patronage, without integrated digital communication or defined audience development policies.
Public accessibility	The museum is open on weekdays from 9:00 am to 5:00 pm, while weekend access is available by appointment only. Visits take place exclusively in person and are based on scheduled access, with limited availability at weekends, which reduces the museum's ability to reach a broader non-specialist audience.
Accessibility of cultural contents	Cultural contents are characterised by an essential level of mediation, based on brief introductory panels and minimal captions for most artefacts. Historical-critical contextualisation is partial and accessibility for non-specialist audiences is limited; no digital support tools are provided. Contents are available on site only and are mainly oriented towards specialist audiences.
Sustainability – inclusion – innovation	Policies on sustainability, inclusion and innovation are not structured. While attention to heritage protection and the educational role of the museum has historically been present, it is not supported by long-term strategies, and the adoption of digital tools and innovative museographic practices is absent. Overall, these issues emerge only implicitly and are not formalised in dedicated policies or projects.
Social media – website – contacts	The museum uses Instagram, Facebook and YouTube mainly for informative and promotional communication. The recent relaunch of the Instagram profile (March 2025) marks the beginning of a digital repositioning process, which is not yet embedded within a structured editorial strategy nor integrated with audience development projects.
Additional information	
Venue use	The building, originally conceived for charitable and educational purposes as the former "Ritiro per Matrone Vergini e Citelle", is a historic structure now housing the museum and a training centre. The pre-existing architectural elements have been adapted for exhibition use through specifically designed furnishings and display solutions.
Date of foundation / date of possible closure	Year of foundation: 2003
Date of compilation	December 2025
Curator	Ornella Cirillo
Author	Andrea Chiara Bonanno
Official sources and databases	https://culture.gov.it/it/luogo/museo-del-tessile-e-dell-abbigliamento-elena-aldobrandini https://museodellamodanapoli.com

Fig. 04

resources and organisational structure, highlights not only an operational gap but also two distinct cultural models of heritage management.

On the one hand stands the Museo Salvatore Ferragamo, a museum not only of a private nature but also belonging to a company included within the perimeter of the Ferragamo Group, which, given its economic relevance, is even listed on the stock exchange. The museum is endowed with a stable organisational structure and with continuous economic and professional resources, although no autonomous financial statements of the museum itself are available among publicly accessible sources.

On the other hand, the comparison involves the Museo della Moda di Napoli, a public institution whose activities depend to a large extent on funding periodically allocated by territorial public bodies, in particular by the Campania Region. This structural difference has a direct impact on programming, on the continuity of activities, and on the capacity to invest in areas such as conservation, research, communication and heritage enhancement. The most recent financial statements clearly show that the Neapolitan institution is supported almost exclusively by regional funding, which amounts to approximately €300,000 per year and is necessary to cover most operating costs, including staff-related expenses, together with revenues from ticket sales, which average about €8,000 per year[3].

The Museo Salvatore Ferragamo stands out as one of the most advanced examples of corporate museums in Italy. The data emerging from the record show a structure that is strongly integrated within the brand's identity strategy: the scale of the collection—over 10,000 artefacts from the corporate historical archive—is supported by an analytical cataloguing system, based on dedicated databases and internal archival standards that allow the rapid identification of materials for the development of exhibitions. Since 2006 this has enabled the museum to implement a system of annual thematic displays, each grounded in a specific research project and designed to valorise, year after year, different segments of the historical archive, also thanks to the presence of dedicated storage facilities, formalised preventive conservation policies and scheduled restoration programmes that ensure a systematic and continuous management of the heritage.

From the perspective of cultural experience, the Florentine museum offers a high level of mediation: articulated interpretative texts, multimedia tools, QR codes and digital supports contribute to constructing a structured museum narrative accessible even to non-specialist audiences, in line with a mission pursued since the mid-1990s. Inaugurated in 1995 at the initiative of the Ferragamo family, the museum was conceived not merely as a celebratory tribute to the founder, but as a cultural instrument aimed in particular at younger generations, promoting awareness of the artistic qualities, inventiveness and experimentation that transformed the role of footwear in international fashion and established Salvatore Ferragamo as a leading figure in twentieth-century design and fashion. This approach is embedded in a broader audience development strategy integrating social media, multimedia content production,

3 https://museodellamodanapoli.com/amministrazione-trasparente/bilanci/bilancio-2024/

publishing and educational activities. In this sense, its recognition as the first green museum in Italy and the adoption of innovative technologies—such as Dolby Atmos audioguides for the inclusion of visitors with visual impairments—testify to its full adherence to the principles of sustainability, inclusion and innovation pursued by RHITA. The picture emerging from the record of the Museo della Moda di Napoli is markedly different. The museum displays a less exemplary structure, characterised by lower financial stability and a limited staff. Its collection, comprising approximately 300 artefacts largely derived from private donations and heterogeneous holdings, does not follow a unifying criterion and reflects a logic of accumulation rather than an organic cultural project.

The critical issues are concentrated primarily in the areas of cataloguing and conservation policies: data accessibility is partial, as are preventive conservation policies. Restoration interventions are sporadic and dependent on the availability of external funding. Cultural accessibility is likewise limited, with the absence of digital support tools and a minimal level of interpretative mediation, making the exhibition path intelligible mainly to specialist audiences.

A particularly significant concern relates to communication and heritage marketing. While the Museo Ferragamo integrates events, publications, social media and digital channels within a coordinated strategy, the Museo della Moda di Napoli displays fragmented valorisation actions. Exhibitions and events—although numerous and often of high scholarly value, such as the recent exhibition on Fausto Sarli entitled *Sarli*, curated by Paola Maddaluno and sponsored by the Italian National Chamber of Fashion—are not embedded within a continuous curatorial programme.

With regard to relations with the territory, the Neapolitan museum demonstrates a commitment to training and research through internship agreements and collaborations with universities and higher education institutes. However, these relationships tend to be episodic and are not consistently translated into audience development programmes or participatory projects involving local communities. By contrast, the Museo Ferragamo, thanks to its structured involvement with universities, cultural institutions and foundations, succeeds in anchoring its heritage within the local context, transforming it into a shared cultural resource.

The comparison between the two cases makes particularly evident the decisive role played by professional competences in shaping the cultural quality of a fashion museum. At the Museo Salvatore Ferragamo, the presence of a clearly identifiable scientific direction and a staff composed of specialised professionals—fashion historians, archivists, curators and communication managers—enables the archive to function as a genuine research laboratory, capable of generating multi-thematic narratives, structured exhibition projects and a continuous programme of activities. Heritage is not merely preserved but becomes a living substance of interpretation and cultural production.

At the Museo della Moda di Napoli, by contrast, the lack of professional profiles specifically trained in fashion studies and contemporary museology significantly affects the institution's ability to define a coherent curatorial vision. The predominance of administrative functions over scientific and project-oriented roles makes it more difficult to develop medium- and long-term strategies and to construct critical narratives capable of conveying the value of the collections. In this context, the museum appears more oriented towards preservation and routine management than towards cultural production, with evident repercussions on the quality and continuity of its offer.

CONCLUSIONS

In conclusion, this component of the Research Unit of the University of Campania, in relation to the amount of person-hours allocated to this specific focus of the project, was not able to carry out a complete mapping of archives and museums holding fashion-related heritage. As stated in the title, however, the aim was to identify methodological and cultural orientations through which to frame this subsequent phase of research. First of all, we believe that this activity should be addressed through the use of a census record renewed in its fields. The exemplification carried out by us demonstrates that such a tool does not merely list what exists, but makes it possible to critically assess the "how" of fashion heritage: how it is preserved, communicated, made accessible, and integrated into processes of innovation,

sustainability and inclusion. The Museo Salvatore Ferragamo emerges as a model of excellence, fully aligned with contemporary approaches to Fashion Heritage, whereas the Museo della Moda di Napoli, despite possessing a heritage rich in potential, reveals a set of structural weaknesses that call for targeted interventions in terms of expertise, resources and project planning.

The overall result highlights that only through an expanded, multidimensional record, consistent with the principles of reshaping, is it possible to assess the true potential of museums or archives in the field of Fashion Heritage, going beyond the partial framework provided by institutional repertories.

In this sense, the mapping carried out within RHITA assumes an operational role: it does not merely describe what exists, but proposes criteria for evaluating the quality of cultural provision, identifies models of good practice, and defines useful indicators to guide future policies for the enhancement of national fashion heritage. The extension of the record fields devoted to sustainability, innovation, digitalisation, training, relations with the territory and heritage marketing strategies responds precisely to this need: to transform the survey into a critical tool capable of influencing cultural programming and the ability of institutions to engage with an increasingly active and technologically literate public.

ACKNOWLEDGMENTS

The authors have shared the contents of the essay, but specifically authored by First Author (Ornella Cirillo) are paragraphs 1 "Introduction", 2 "Which museum and which archive for fashion?" and 3 "The prerequisites for mapping", and by Second Author (Andrea Chiara Bonanno) are paragraphs 4 "Structure of the form: items and contents", 5 "Two case studies" and 6 "Conclusions".

CAPTIONS

[Fig. 01] Madama Thérèse Tailors, dress fitting, 1932, Naples (Archivio Parisio)

[Fig. 02] Modeling department of Manifatture Falco, 1959, Naples (Archivio Parisio); Spaces for the sale of clothing and accessories at Piper Market near Largo Amendola, 1967, Naples (Archivio Riccardo Carbone)

[Fig. 03] Partial view of the permanent exhibitions dedicated to Livio De Simone and Fausto Sarli, Museo della Moda di Napoli.

[Fig. 04] Completed form template based on the case study of the Museo della Moda di Napoli

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ARCHIVING AND REACTIVATING MADE IN ITALY:

OPERATIONAL DEFINITIONS, MAPPING ACTIONS. THE RESEARCH ACTIVITIES AT THE IUAV UNIVERSITY OF VENICE

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Abstract

The text reflects on the role of archives in defining the concept of Made in Italy, particularly through an analysis of the active role played by archives—in their dual material and immaterial nature—in reactivating the mechanisms of design and production that define the heritage and cultures of Italian fashion today. The text therefore presents part of the work carried out by the research unit at the IUAV University of Venice to map the Made in Italy system. The text uses a theoretical approach that productively combines curatorial considerations with historical-critical paradigms, within a cultural horizon that recognizes the central role of immaterial design actions, and aims to reflect on the operational definition of fashion heritage.

Keywords: *Fashion, Archive, Made in Italy, Exhibitions*

The RHITA project originated also from a series of initiatives linked to the work that the fashion research group at the IUAV University of Venice has been carrying out for some time. These initiatives have explored and continue to explore the Made in Italy dimension through a focus on the history of Italian fashion, understood as a complex system that brings together the creative and conceptual dimensions with the productive one. This text provides an opportunity to clarify the elements that form the basis of the IUAV research unit's work, and therefore the cultural premises for our university's contribution to the RHITA project. Research activities relating to archives involve their identification and exploration: a study that means recounting them and at the same time reactivating them. The archives thus become the basis for imagining design actions, but above all they become fundamental – through the curatorial action of creating exhibitions – for focusing on an idea of Made in Italy that is effectively operational, capable of connecting with the past and projecting itself into the future.

Firstly, it should be noted that the discussion surrounding Made in Italy at the IUAV University of Venice is linked to the presence of the Pro Research in Integral Design Environment Laboratory (PRIDE.IT), which operates within IR.IDE (Integral Design Environment Research Infrastructure, established in 2018). The Pro Research Laboratory in Integral Design Environment (PRIDE) is dedicated to integral

design extending from the territory to the human body. In particular, starting from the relationship between heritage and innovation, the studies developed in the laboratory address from different points of view the need to express a more appropriate, non-standardized idea of Made in Italy. Within PRIDE, the *Habit, Archives and Body* section has promoted the development of research on fashion design and clothing cultures in relation to the body and the environment. The various actions have taken into account the complex dimension of the Italian fashion system between heritage and innovation. The study of Made in Italy is placed in relation to the rich productive fabric of the Veneto region and is accompanied by research into strategies for identifying and reactivating Italian fashion archives as places of memory and design research.

Within this laboratory, the placement of the disciplinary field that deals with fashion is neither obvious nor automatic. The workshop has promoted research activities that have skilfully combined theory and practice, continuously questioning fashion design practices, taking into account the complex nature of the Italian fashion system, a system that moves between heritage and innovation, giving rise to what we sometimes refer to, perhaps a little too automatically, as Made in Italy. In this sense, reflection on the Italian fashion project has allowed us to think, for example, about the definition and redefinition of the creative figure,[1] who confronts the reality of industrial production by bringing together conceptual reflection and practices that characterize the product.

The specific focus on Made in Italy, further enhanced by the proximity to the realities that animate the rich productive fabric of the Veneto region, has favored paths that have brought concrete experimentation in the areas of textiles, knitwear, and leather goods for the creation of clothing and accessories closer to the dimension of so-called immaterial design: research has also focused on the sectors of image production and fashion publishing. This line of research was complemented by an investigation aimed at identifying strategies for reconstructing and connecting Italian fashion archives (both corporate and private) in order to enhance their value not only as places of memory but above all as places of research and design (fundamental in this sense for clarifying or creatively rethinking the identities of brands and companies).

The other important group that has enabled the development of a sophisticated reflection on Made in Italy at IUAV is the FLAIR (Fashion Lab Archive Industry Research) cluster.[2] The cluster brings together research carried out over time and enhances it. I am thinking in particular of projects such as the one that led us to produce the book and exhibition *Italiana: Italy through the Lens of Fashion 1971-2001* (Frisa et al., 2018): this is an important and complex outcome that has made explicit the necessary reflection on the concept of Made in Italy, its history and current relevance, and the qualities of Italian fashion. Thanks to this project, Made in Italy has become clear to us as a conceptual horizon that we have defined in comparison with the global production and communication system; at the same time, Made in Italy refers to the concept of the supply chain and the production capabilities of the districts scattered throughout our country. The exhibition and the book took the form of a sort of permanent laboratory for reflection and experimentation on the production practices that define Italian fashion products and their value. When we decided to embark on the research that led to the project, the working group wanted to identify certain elements that could account for those thirty years that saw the consolidation and international celebration of the relationship between fashion and Made in Italy. Maria Luisa Frisa and Stefano Tonchi write in the essay that opens the volume:

Italiana amounts to a sort of dystopian utopia. That of being able to give form and value—through facts, dreams, visions, creators, prima donnas, second leads, chance passersby—to a story of Italian fashion over those thirty seminal years that saw it define itself in a symbiotic relationship with the social, political and cultural history of our country and take on a leading role

1 See, for example, the seminar Sintonie italiane. Milano anni 80: laboratorio di idee e linguaggi (Italian Harmonies. Milan in the 1980s: a laboratory of ideas and languages) curated by Elena Fava and organized as part of the PRIDE Laboratory on May 28, 2021 [https://www.iuav.it/DIPARTIMEN/IRIDE/EVENTI/2021/Alla-ricer/Sintonie-i/index.htm].

2 See https://sites.google.com/iuav.it/iuavclusterflair/flair.

at an international level. In an exploration that proceeds by concepts and visions, the narration of Italiana aims to draw simultaneous attention to all the players who, in different ways, make up the vivid and many-voiced story of Italian fashion. It is a journey that the curators have made almost solo, so as not to let themselves be distracted, but in close contact with a team of scholars, journalists, writers and researchers who have contributed the many texts that in various formats compose the book—a work group characterized by sometimes contrasting viewpoints, but guided by the desire and determination to arrive at results all could agree on. The journey has not been an outing, an expedition or something of that kind: it has been an experience of interpretation and decipherment in which every new discovery interacted with the memories we carried with us or shook up our preconceived ideas. (Frisa & Tonchi, 2018, p. 7)

The group of researchers who worked on the project coincides with the people participating in the Flair cluster, and it is thanks to *Italiana* that the IR.IDE was able to focus on Made in Italy as a research topic, which the infrastructure intended to interpret as a conceptual horizon that moved from fashion towards and connected with other design disciplines that have animated IR.IDE's activities. This is because the operation carried out with Italiana aimed precisely to restore substance to the history of the international success of Made in Italy, going beyond the concreteness of objects and articulating design and production actions between materiality and immateriality. The meaning of the iconographic atlas that animated the volume and represented part of the research carried out to organize fashion was precisely to give substance to the visual culture of Made in Italy, through the explicit and extensive use of magazines, in the awareness of the role that periodicals played, throughout the 20th century and in its specific phases, in developing a visual narrative of fashion, as devices that simultaneously photograph and determine styles, through a mix of fashion, current events, cinema, television, art, and drawing on multiple registers (Monti, 2018). This atlas identified magazines as laboratories that consolidated the iconography of Italian fashion and established and disseminated a shared visual language that defined the characteristic elements and atmospheres of Made in Italy.

In 2020, reflection on Made in Italy took on a new meaning, namely the possibility of connecting this conceptual horizon with an analysis of the state of Italian fashion studies. The exhibition *Memos: About Fashion in this Millennium*, curated by Maria Luisa Frisa and designed by Judith Clark at the Poldi Pezzoli Museum, revived the seminal exhibition curated in 1980 by Grazietta Butazzi at the Poldi Pezzoli Museum in Milan, *1922-1943: Vent'anni di moda italiana* (Butazzi, 1980), which I studied in depth thanks to materials recovered from the archives of the Poldi Pezzoli Museum and disseminated for the first time during my research (Monti, 2020). Recovering Butazzi's exhibition allows us today to raise central questions about the cultural status of fashion in relation to the exhibition machine and the museum, at the beginning of a decade, the 1980s, which was fundamental not only in the development of the fashion exhibition device, but above all in the definition of fashion itself as a discipline, through the attention paid to themes and issues such as the reconstruction of its history, the conservation of objects, and the problem of museum exhibition practices in relation to forms of commercial display. Recovering this exhibition means moving between the story of an important exhibition event and the analysis of its role within fashion studies, in years when, especially in Italy, awareness developed of the need to imagine devices and institutions capable of preserving and studying fashion. Looking at this exhibition today means reflecting first and foremost on the Italian situation, because even today one of the central issues in Italy is the absence of a precise cultural policy aimed at establishing a national fashion museum capable of competing on the international stage. Recovering fashion and Butazzi's work, also in relation to the intentions of the exhibition curated by Frisa, means addressing the state of Italian fashion studies and the cultural status of fashion as a discipline that is being developed in comparison with the museum and the practice of fashion curating. *Memos*, in the intentions of curator Frisa as expressed in Clark's exhibition design, appears today as a project that shares with Butazzi and his words an Italian interpretation of fashion studies, evoking these theoretical movements through a sophisticated curatorial project: the three-dimensional display seeks to take stock of contemporary fashion and its forms, but above all consciously reaffirms

the need to set up and articulate Italian fashion studies through devices and institutions capable of preserving, exhibiting, and studying fashion.

We must not forget the importance of exhibitions in reconstructing the history of Italian fashion. In its material and immaterial forms, ranging from objects to practices and processes, which are so difficult to define and "archive," but which are nevertheless fundamental in defining the Italian qualities of our fashion design and our fashion system.

Last month I flew to Rome to attend the opening of a fashion exhibition at the Villa Medici. The single most ravishing dress on display was a ruby satin ball gown designed in 1950 by the great French couturier, Jacques Fath. Like everything in the exhibition, it came from the personal collection of Enrico Quinto and his partner Paolo Tinarelli. I met Enrico last year, while working on my FIT exhibition Fashion, Italian Style, to which he loaned a blue cocktail dress by Simonetta and a rare Walter Albini dress. Both of "my" dresses were once again on view in Rome, along with about 100 others, spanning the past century - from Paul Poiret to Yohji Yamamoto. Although the chronological organization was old-fashioned, the exhibition was innovative inasmuch as it unselfconsciously integrated Italian fashion into the history of twentieth-century dress. (Steele, 2004, p. 1)

In 2004, Valerie Steele began her *Letter from the Editor* in this way, opening the issue of the journal *Fashion Theory* (volume 8, issue 1). For us Italian fashion scholars, it was an important recognition of Italian fashion and its cultures, coming from the director of the FIT Museum and the most important journal for academic fashion studies. What was significant was the fact that an exhibition that restored Italian fashion to its rightful place on the international scene did not originate from a museum collection but from an extraordinary private collection, that of Enrico Quinto and Paolo Tinarelli, documented in detail in the book published on the occasion of the exhibition (Quinto & Tinarelli, 2003).[3] Without going into detail, Steele's short text already pointed out in 2004 the importance of private collections in triggering the storytelling of Italian fashion, in a situation, the Italian one, that was quite anomalous, due to the evident absence of a museum institution dedicated to fashion capable of competing with the great international museum experiences (just think that in 2002, the MoMu in Antwerp had inaugurated its successful exhibition season).

Two projects in particular, which I had the opportunity to work on, confirmed the importance of private archives in reconstructing the history of Italian fashion. These two occasions highlight one of the lines of research that characterizes the aforementioned FLAIR research cluster, namely the focus on the forms that define Made in Italy. This research led us to produce the book and exhibition *Bellissima: Italy and High Fashion 1945-1968* in 2014 (Frisa et al., 2014), and the aforementioned book and exhibition *Italiana: Italy through the Lens of Fashion, 1971-2001* in 2018. These are two important and complex outcomes that have brought to light a reflection on the concept of Made in Italy and the qualities of Italian fashion. Thanks to these two projects, Made in Italy has become a conceptual horizon that we have defined in relation to the global production and communication system. At the same time, Made in Italy refers to the concept of the supply chain and the production capabilities of the districts scattered throughout our country. The exhibitions and books have taken the form of a sort of permanent laboratory for reflection and experimentation on the production practices that define Italian fashion products and their value. In both cases, it would not have been possible to achieve a satisfactory outcome without meticulous work mapping the valuable private archives scattered throughout the country. This was a complex task, which had to rely primarily on word of mouth and on identifying individuals within companies, often no longer in business, who, despite not having the necessary expertise, had been involved in building or at least sketching out an idea of an archive.

In the case of *Bellissima*, for example, in its edition at Villa Reale in Monza (photographically

3 See also the most recent project Italian glamour: L'essenza della moda italiana dal dopoguerra al XXI secolo: la Collezione Enrico Quinto e Paolo Tinarelli (2014).

documented in Frisa et al., 2016), a central role in the exhibition design was played by the corridor connecting all the rooms displaying the themes of the exhibition: this gallery housed a spectacular selection of materials testifying to the importance and centrality of our textile industry in the creation and promotion of Italian fashion, both yesterday and today. The relationship between Italian haute couture and the textile industry, in its most successful expressions such as daywear, became the key to understanding recent developments in fashion. Among the company archives involved in the project—the result of extensive research and systematization—were Agnona, Botto Giuseppe e Figli, Clerici Tessuto, Faliero Sarti, Filatura Fratelli Galfione, Fratelli Tallia di Delfino, Lanerossi, Lanificio Annibale Bozzalla, Lanificio Faudella, Lanificio di Pray, Lanificio Pria, Lanificio Rivetti, Lanificio Zignone, Luigi Verga, Marzotto Group, Taroni, Piacenza Cashmere, and Tessitura Serica Bedetti Pedraglio.[4]

In the case of *Italiana*, the visit to the Zamasport company was a key moment in explicitly understanding, through highly sophisticated results, the role of design in its relationship with production. The discovery at Zamasport of the Callaghan brand archive—built with almost museum-like awareness and capable of spanning all the styles of designers from Walter Albini to Gianni Versace, Angelo Tarlazzi, and Romeo Gigli—led the curatorial team to briefly consider that we could perhaps organize an exhibition on the Callaghan experience, instead of a choral and ambitious project such as Italiana (Danese, 2018).

These two experiences have in some way highlighted the importance of mapping private archives dedicated to Italian fashion, and at the IUAV University of Venice, this awareness has translated into a specific investigation aimed at identifying strategies to reconstruct and connect Italian fashion archives (both corporate and private), in order to enhance their value not only as places of memory, but above all as places of research and design: in this sense, fundamental for clarifying or rethinking in an inventive way the identities of brands and companies, as well as the identity and history of Italian fashion. The idea of mapping goes beyond a purely historiographical project to tackle issues that investigate the dimension of production and, more generally, the Italian industrial system. In this sense, the research questions the archive not only as a place where the history of a company is preserved, but also as an active engine that contributes to building (and inventing) heritage and nurturing the value of production between material and immaterial aspects.

Reflecting on the history and current situation of Italian fashion studies, in relation to the need for a museum and cultural policies capable of competing with the actions of the most important international institutions dedicated to fashion and its forms, is a way of addressing the concept of Made in Italy, overcoming the banal automatism of associating this conceptual horizon with the labels that have carried Italian fashion around the world. In 1981, Grazietta Butazzi wrote:

At a time when fashion "consumption" is becoming frenetic, even in terms of theory and interpretation, a new book on fashion may seem redundant. It is precisely in terms of interpretation—or, more modestly, as a suggestion of some keys to interpretation—that, hopefully, it may not be. […] The texts are not intended to present a history of fashion, but rather to propose some – and only some – ways of approaching this history: social symbols, the status of groups such as women or young people, the behavior of power in the face of fashion, the impact of political events and profound changes in customs, and cultural movements. (Butazzi, 1981, p. 5)[5]

This is an excerpt from the introduction to the book *Moda: Arte / storia / società* (*Fashion: Art / History / Society*), which still stands today as a pioneering example of a manual that aims to recount fashion through time—without worrying about following a chronology—and recognizing its central role in the mechanisms of design and the functioning of society and culture. It is an extraordinary book, also in the way it uses and reassembles images, short-circuiting them, explicitly and inventively seeking new relationships between the formal qualities of the iconographic

4 This text refers to the installation at Villa Reale in Monza, the second stage of the exhibition Bellissima, documented photographically in Frisa et al., 2016.

5 Translated by the author.

materials used and the themes addressed in the critical texts. Butazzi's pioneering work (to which can be added his collaboration with Alessandra Mottola Molfino on the series of volumes *Idee di moda* [*Fashion Ideas*] published by De Agostini between 1991 and 1992) allows us to reflect on the history and future of Italian fashion studies: it is a historical-critical perspective that today is capable of identifying new avenues for seeking an open and operational definition of Made in Italy.

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(RE)ACTIVATING FASHION DESIGN AND PRODUCTION SOURCES:

EXPLORING ITALIAN FASHION HERITAGE THROUGH DIGITAL AND PARTICIPATORY PRACTICES

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Abstract

The article proposes to elaborate a definition of fashion design and production heritage, with a specific focus on the Italian fashion system and manufacturing chain. It does so by proposing the case study of the workshop "Disegni, Illustrazioni, e cartamodelli" ("Drawings, Illustration, and Paper Pattern"). The workshop was developed by applying the model of the living lab, and activated within the context of the PRIN 2022 PNRR research project *ResHaping made in ITAly (RHITA - https://www.rhita.eu/). Circular Models for Italian Fashion Heritage and Manufactures through Digital Inclusivity and Conscious Innovation.* The research conducted within fashion design and manufacturing archives, collections and museums highlighted the richness of production and process sources as a prominent part of Italian fashion heritage, which remains often unaddressed. The article proposes to investigate how a study on the status of garment design and production sources (such as sketches, textile swatches, calicos, paper patterns) might help to engage with Italian fashion heritage focusing on the multiple characteristics of design and manufacture.

Keywords: *Fashion Pedagogies, Phygital, Fashion Heritage, Manufacturing, Living Lab*

INTRODUCTION

Fashion research within GLAMs (galleries, libraries, archives, and museums) tends to adopt a garment-centered approach, which marginalises sources that document the multiple processes and authorships behind clothing design and manufacturing. The article proposes to investigate the potential of studying fashion design and production sources in the context of the Italian fashion industry. The main objective of this paper is to provide a definition of garment designs and production sources, through exemplary case studies found within Italian fashion GLAMs. These processual documents are often overlooked within the field, due to a lack of interest and un-unified methods for their investigation. As such, the research applies an experimental approach to the study of garment design and production sources using the format of a participatory workshop activity to re-activate these materials and foster embodied engagement.

The workshop described in this paper is titled "Disegni, illustrazioni e cartamodelli" (drawings, illustrations, and patterns) and took place at Iuav University of Venice, involving students from the Bachelor's Degree Programme in Fashion Design and Multimedia Arts. The workshop explored the potential of pattern making and digital tools to study and re-activate fashion sources. Specifically, the activity focused on materials such as drawings, illustrations, and patterns [Fig. 01], documents that, within a fashion archive, reveal design thinking and processuality.

The activity is to be considered as an exemplary

case study in the format of the living lab, developed in the context of the project *ResHaping made in ITAly* (RHITA - https://www.rhita.eu/). *Circular models for Italian fashion heritage and manufactures through digital inclusivity and conscious innovation* [1]. The research conducted for the development of the workshop activity involved multiple stakeholders included in the preliminary mapping developed within the first phase of the RHITA project, and regarded as best practices: Museo Fortuny (Venice), CSAC of the University of Parma, Fondazione Roberto Capucci (Udine), Lanificio Paoletti Archive (Treviso). Moreover, the workshop has been designed and conducted in collaboration with Martina Ponzoni, 3D fashion design specialist, founder, and director of *d_archive* (a platform with the purpose is to support the preservation of fashion heritage and make it accessible digitally - https://darchive.io/) [2]. Being both fashion designers and practitioners, we developed the workshop highlighting the potential of applying fashion design knowledge, such as pattern making and 3D fashion skills, to the study of fashion heritage. As a 3D fashion design specialist, Ponzoni provided specific knowledge in the design of digital replicas of fashion artifacts (garments and accessories) that allowed the students to interact and reactivate the archival sources in between the digital and physical dimensions.

Fig. 01

THEORETICAL CONTEXT: ITALIAN FASHION DESIGN AND PRODUCTION SOURCES

To introduce the characteristics of garment design and production sources, the paper provides a brief context regarding where and by whom these materials have been studied and conserved; and a detailed description of the research conducted within the archives involved.

Overall, garment design and production sources are still an underappreciated type of material in Italian fashion archives, mainly because fashion heritage is fragmented among small businesses and brand archives. As Maria Luisa Frisa and Stefano Tonchi argue in the catalog of the exhibition *Italiana. L'Italia vista dalla moda 1971-2001*, of which they are curators, the absence of a clear policy on fashion and its cultures has led to the dispersion of an extraordinary heritage of artifacts produced by the constellations of designers and companies that shaped Italian fashion (Frisa & Tonchi, 2018). To overcome this dispersion, in 2023 Promemoria Group (a company founded in 2011 and expert in corporate and institutional heritage enhancement) published, within the magazine *Archivio n°9 – The fashion issue,* an inserted poster curated by Accurat (a data visualisation design studio based in Milan) providing information about fashion archives distributed on the Italian territory and showcasing an extreme richness of materials and archive, but also emphasizing their fragmentation.
Of all these process-oriented materials (such as paper patterns, calicos, sketches, and sketchbooks), fashion drawings and illustrations are perhaps the most thoroughly studied. Specifically, the research on the topic was conducted mainly in the 1980s at the CSAC (Centro Studi e Archivio della Comunicazione) of Parma University (Italy). The research center, as mentioned by its founder Arturo Carlo Quintavalle,[1] has collected a large number of fashion sketches: almost 70.000 italian fashion drawings; however, as he mentions in

1 Arturo Carlo Quintavalle founded the research centre Centro Studi e Archivio della Comunicazione (CSAC) at the Parma University in 1968. The center has focused since its foundation on the preservation of artworks, photographs, architectural drawings, design, fashion, and graphic works, as well as organizing numerous exhibitions and publishing related catalogues.

1987, still much remains to be analysed about fashion illustration, since fashion design sources have largely been lost or simply scattered or hidden (Quintavalle in Bianchino Eds., 1987, p.10). Interestingly, fashion drawings are analysed in the context of CSAC as sources that highlight part of the design process in fashion. For this reason, Bianchino and Quintavalle often stress the importance of distinguishing between fashion illustration – designed *posteriori* to the making of the garment for communication purposes – and actual fashion design drawings – the actual design drawing that is made by the designer/*stilista*/*couturier* while developing the project, considered as actual traces of a design process (Bianchino & Quintavalle Eds., 1989).

In the catalogue of the exhibition *Italian fashion designing 1945-1980* Bianchino reflects on fashion drawing and illustration as a genre, in relation to the two modes of production and fashion design spread in Italy between 1945 and 1980: *Alta Moda* and *prêt-à-porter*.[2] Within prêt-à-porter, there is a complete turnover: if in the Alta Moda ateliers the design process was outsourced and the actual making was in-house, for the prêt-à-porter the situation is reversed, the design process is entrusted to a leading figure, the *stilista*, while the actual garment construction happens externally, in factories often located far from the site of design (Bianchino 1989, p.47). Each designer develops their own approach to the fashion sketches, based on the references that are very much specific, and differ studio by studio. The sketches are also more detailed with information on textiles, finishings and trimmings, because they are used to communicate with product developers in the industrial production (Ibidem).
Bianchino and Quintavalle, together with Bonizza Giordani Aragno (1982) investigated the role of fashion drawings in the study of Italian fashion between the 1950s and 1980s. Their work shades light on the potential of analysing such documents from a cultural perspective, they highlight the existence of other figures than the designer, such as the illustrator, but they are also capable of explaining the dynamics of each fashion system: on one hand the Alta Moda, on the other hand the prêt-à-porter. From Bonizza Giordani Aragno's research on fashion drawings (1982), a key aspect emerges: the intention to draw attention to the 'hidden side of fashion,' identifying drawing as a 'less celebratory' element accessible only to industry experts (Ivi, p.10). While fashion studies tend to focus on the garment in relation to its formal description, to the brand and designer biography or the biography of the wearer, many phases of the design and production process remain unaddressed. Fashion drawings have attracted the interest of many art historians, likely because these drawings can be examined through the lens of traditional art genres (Bianchino, 1989, p. 39). Many other sources documenting other phases of the fashion design and production processes still need in-depth research and appropriate methods to be studied.

EXEMPLARY CASE STUDIES FOUND IN ITALIAN FASHION GLAMS

The research conducted within Italian fashion GLAMs encompassed museums, private collections, and manufacturers' archives. This diversity of institutional and non-institutional sources also highlights the widespread distribution of fashion heritage across Italy. Within the context of this study, all recovered materials are considered equally significant, as they contribute pieces to a broader history that includes not only the well-known names of renowned couturiers but also the knowledge and practices of numerous other actors in the Italian fashion landscape.
The materials collected from diverse GLAMs can be organised into different categories: fashion sketches and illustrations; textile swatches (including technical descriptions and colour recipes); printing matrix; and manuscript paper patterns. The categories will be described in the following paragraphs.

(i) Fashion sketches and illustrations:

(1) Fashion sketches and illustrations by Roberto Capucci conserved by the Fondazione Roberto Capucci [3]. Among

2 In Italy, the birth of prêt-à-porter is generally dated to 1975 as the "official starting date". However, Bianchino agrees with several fashion journalists in tracing its origins back to 1972, one year after Walter Albini's autumn/winter 1971-72 fashion show in Milan at Circolo del Giardino; for the author by 1974, a new era was firmly established when Missoni, Krizia, Caumont, and Trell presented their collections in Milan. Bianchino, however, specifies: "Per noi prêt à porter non vuole solo dire 'moda pronta' ma piuttosto un diverso modo di intendere la moda, un diverso modo di progettare, non solo gli abiti, ma anche il comportamento, il corpo." ("For us, prêt-à-porter does not merely mean 'ready-to-wear' but rather a different way of understanding fashion, a different approach to design – not only of clothing, but also of behaviour and the body.") (Bianchino 1989, p. 44).

the many sketches and drawings conserved within the foundation, the research conducted in the archive led to the selection of three specific cases:
The illustrations of two of the most iconic lines developed by Roberto Capucci: The *Bocciolo Line* Spring/Summer 1956 and the *Scatola Line* Autumn/Winter 1958; and a collection of multiple drawings and sketches Spring/Summer 1966. Compared to the illustrations of the *Bocciolo* and *Scatola* lines, which are probably illustration designed a posteriori, the sketches for the Spring/Summer 1966 collection clearly showcase the design approach of the couturier to the development of the collection. The process involved sketching and drawing on a large scale, sketching multiple different lines until the individualising the final selection.

(2) Fashion sketches from the Krizia Collection conserved at the CSAC of Parma University [4]. In this case, the collection has been consulted through the digital database, which allows the selection of a few case studies: five different sketches of diverse collections dated between 1968 and 1976. The sketches showcase a specific approach to fashion design, that of Italian prêt-à-porter. However, no clear information was available regarding the illustrator or designer, but also the actual final garments, whether they had been put into production or not.

(ii) Textile swatches:

(1) The textile swatches were selected from the Archive of Lanificio Paoletti [5]. The research has been conducted both within the current archive (a room preserving recent collections) and within the historical archive of the Lanificio Paoletti, dating from the nineteenth century onwards, preserving fabric and yarn sample books, production management ledgers, design and manufacturing tools, manuals and specialist journals, historical photographs, and correspondence. Moreover, the research has involved the textile design team, together with other professionals working in the factory that has been of great importance for the selection of the sources.
The selection included two different samples of Chanel textiles, designed by the design team of the woolmill, based on the suggestions of the Chanel design department, together with each's own fabric specification sheet; two samples of textiles from the historical archive dating back to 1977 with their own fabric specification sheet; a manuscript fabric sample book dating back to 1992/1993; and original yarn dye recipe sheets used and still in use for colour development.

(iii) Printing matrices:

(1) The collection of the Fortuny Museum [6] is of great importance to the current research, because it includes not only printing matrices, but also patents of printing and textile techniques invented by Henriette Fortuny and Mariano Fortuny, textile samples, photo documentation, tools, machinery, and books of inspirational images and drawings collected by Fortuny over the years. The printing matrices are of specific interest, since they resemble the shape of a garment's pattern, thus facilitating the reconstruction of the garment for which they were created, but also a specific technique and process. Together with the Museum director Cristina Da Roit, we selected five sets of printing matrices, each belonging to a specific gown or overdress.

(iv) Manuscript paper patterns

(1) Among the selected sources, I recovered a collection of manuscript paper patterns. These items belonged to a home-based professional dressmaker, Lucia Faccoli. The patterns are manuscripts dating between 1987 and 1996, from the pattern company Marfy s.r.l.. The dressmaker used to order specific patterns from the pattern company delivering the specific measurements of the client and would receive the manuscript pattern adapted to the client's body via post in a paper envelope.

All these diverse materials showcase the variety of sources that can be included in a fashion archive,

but also the variety of stories and narratives that emerge from these diverse materials. Often overlooked, these garment design and production sources do not have a specific approach to the way of cataloguing, studying or displaying. This lack of clear structure, however, proved to be an interesting space for experimentation, as it happened with the workshop "Disegni, illustrazioni e cartamodelli".

WORKSHOP AS A PRACTICE AND AS A RESEARCH METHODOLOGY

As briefly mentioned in the previous chapter, the lack of a clear structure to approach, study and investigate sources that trace garment design and production processes in fashion archives led to question through which approach could such sources be engaged. Moved from a personal inclination – being a fashion designer and pattern maker by training – the research shifted towards a design-based approach. This approach also aligns with contemporary fashion research that is growing at the intersection of artistic research, practice-based approaches and theoretical dissemination practices (Gaugele & Titton, 2022, p. 3).
Furthermore, the rise of design and practice-based research methods, allowing for a proximity between thinking, making and wearing (Torres in Gaugele & Titton, 2022, p. 60), challenges dominant fashion epistemologies (Bruggeman, 2025). Thus, instead of focusing on great narratives, star designers and high-end hegemonic brands, practice-based research centers the making process, on the direct experience of the researcher, towards embodied, intimate and diverse perspectives.
Therefore, these process sources (fashion sketches and illustrations, textile swatches, printing matrices, and manuscript paper patterns) were re-activated through a participatory and collective research approach in the format of a workshop.
Ørngreen and Levinsen (2017) identify three different perspectives to consider and conduct workshops within an academic and research context: workshops as a means, workshops as practice, and workshops as a research methodology (Ørngreen & Levinsen, 2017, p.72). Even though no specific quantitative data were collected in a structured way, we still can consider the workshop "Disegni, illustrazioni, e cartamodelli" as a research method, because it served to observe the potential of design-based approaches to the study of garment design and production sources. However, the activity is mainly to be intended as a practice, a designed participatory project wherein participants were invited to engage with the materials, to re-activate them and to produce critical and collective reflections on ways of making, designing and producing fashion.
Furthermore, Thoring, Mueller, and Badke-Schaub (2020) identified different approaches to document a workshop activity as a research methods: notes and direct observation, photos, video recordings, audio recordings, Interviews, group discussions, survey and questionnaires, and produced artifacts (Thoring et al., 2020, p. 5041). Not all the approaches were used to document this activity, however we privileged notes, direct observation, photos, group discussions and we collected an output in the form of a PDF to read and reflect on the research developed by participants.

Fig. 02

CASE STUDY: "DISEGNI, ILLUSTRAZIONI, E CARTAMODELLI"

The workshop "Disegni, illustrazioni e cartamodelli" consisted of a two day activity on the 24th and 25th of June 2025. The participants were students from Iuav University of Venice enrolled in the bachelor's degree programmes in Fashion Design and Multimedia Arts, specifically the second year Fashion Design design *curricula*

students and third year New Media and Fashion Communication *curricula* students. The materials listed in chapter 2.1 were brought into the atelier 2.7 at Magazzino 7 (one of the ateliers commonly used by students for their design and pattern making classes), where students were organised into seven groups of 4/5 participants each. After a brief introduction, we gave the groups time to explore the materials hands-on and to select a case study to explore within the activity [Fig. 02].

The objective of the workshop was to identify through the research the garment to which these design and production sources belonged (or a speculative similar version), to develop a contextual historical and iconographic research and to make the pattern of the garment in order to be able to develop a 3D version of the object using digital software guided by 3D fashion specialist Martina Ponzoni in an approach defined as "Digital Craftsmanship" (Varisco et al., 2025). This would lead to explore the potential of digital tools in studying and reactivating archival fashion sources, especially those materials such as sketches, illustrations, and paper patterns, which document the design and production processes but are often overlooked in garment-centered archival research. Participants were invited to reflect on the role of these design-based materials in shaping fashion knowledge and epistemologies.

The activity was designed in five phases: item record, research, garment record, pattern making, and digitisation.

(1) The Item record phase consisted of completing a documentation form aimed at analysing the selected source. The idea was to guide the participants through a first in-depth observation phase of the source they selected. The analysis was carried out using a structured item record developed *ad hoc* for these types of materials (and for the workshop).

(2) In the research phase, in order to digitally reconstruct a garment starting from an archival source, a research activity was conducted to contextualise the selected document from a historical, stylistic, and design perspective. Moreover, participants were asked to collect materials useful for defining the characteristics of the garment from a tactile perspective. This phase provided the documentary and material basis necessary to proceed with the subsequent digital reconstruction of the garment.

Fig. 03

(3) Afterwards, students were asked to fill in a garment record, to describe, based on the research conducted, the garment they were planning to reconstruct in 3D. This activity produced an overview of the distinctive elements of the garment, providing a structured foundation for initiating the digital reconstruction process.

(4) In the pattern making phase, based on the research conducted and the analysis of the selected document, the garment's pattern was reconstructed [Fig. 03]. In the absence of precise measurements (since the garment was not physically available, but rather reconstructed from speculative hypothesis), reference was made to the standard size used for the relevant garment category (prêt-à-porter or haute couture), drawing on complementary sources and iconographic references to achieve a reconstruction that was as faithful and

consistent as possible.

(5) The digitisation phase was carried out using a 3D software and involved different actions: importing the pattern (from analog to digital), organising the pattern within the 2D workspace on the software system and renaming the pieces according to their function with the addition of the necessary technical indications (notches, pleats, elastics, etc.). Afterwards, a suitable avatar was selected, its measurements adjusted, and its appearance modified to resemble a mannequin for simulation purposes. The pattern pieces were positioned around the avatar and digitally stitched together to make the garment.

Each group selected one or multiple sources from the table: group 01 selected printing matrices from Museo Fortuny; group 02 a drawing from the Krizia Collection (CSAC); group 03 selected the manuscript fabric sample book together with original yarn dye recipe sheets from the Lanificio Paoletti; group 04 worked from the Roberto Capucci's collection of drawings and sketches, Spring/Summer 1966; group 05 worked on the illustration of the *Scatola* line by Roberto Capucci; group 06 selected one of the manuscripted Marfy patterns; group 07 started from another drawing from the Krizia Collection (CSAC).
The activity concluded with two collective moments: an initial mapping of the research processes and a second moment dedicated to the presentation of each group's project [Fig. 04]. The mapping was structured around several key themes that highlighted the main topic of the activity conducted: design, authorship, production, process, inspiration, and collectivity. This mapping made it possible to share the reflections that informed each group's research, and above all to highlight the relationships between the provided themes, across the different research paths and initial sources.
The presentation of the individual projects allowed participants to narrate their research processes, from the initial study to digitisation. In total, seven projects were produced based on the different materials provided [Fig. 05].

CONCLUSION: WHAT FASHION DESIGN AND PRODUCTION SOURCES MIGHT TEACH US

This conclusive chapter is articulated into two

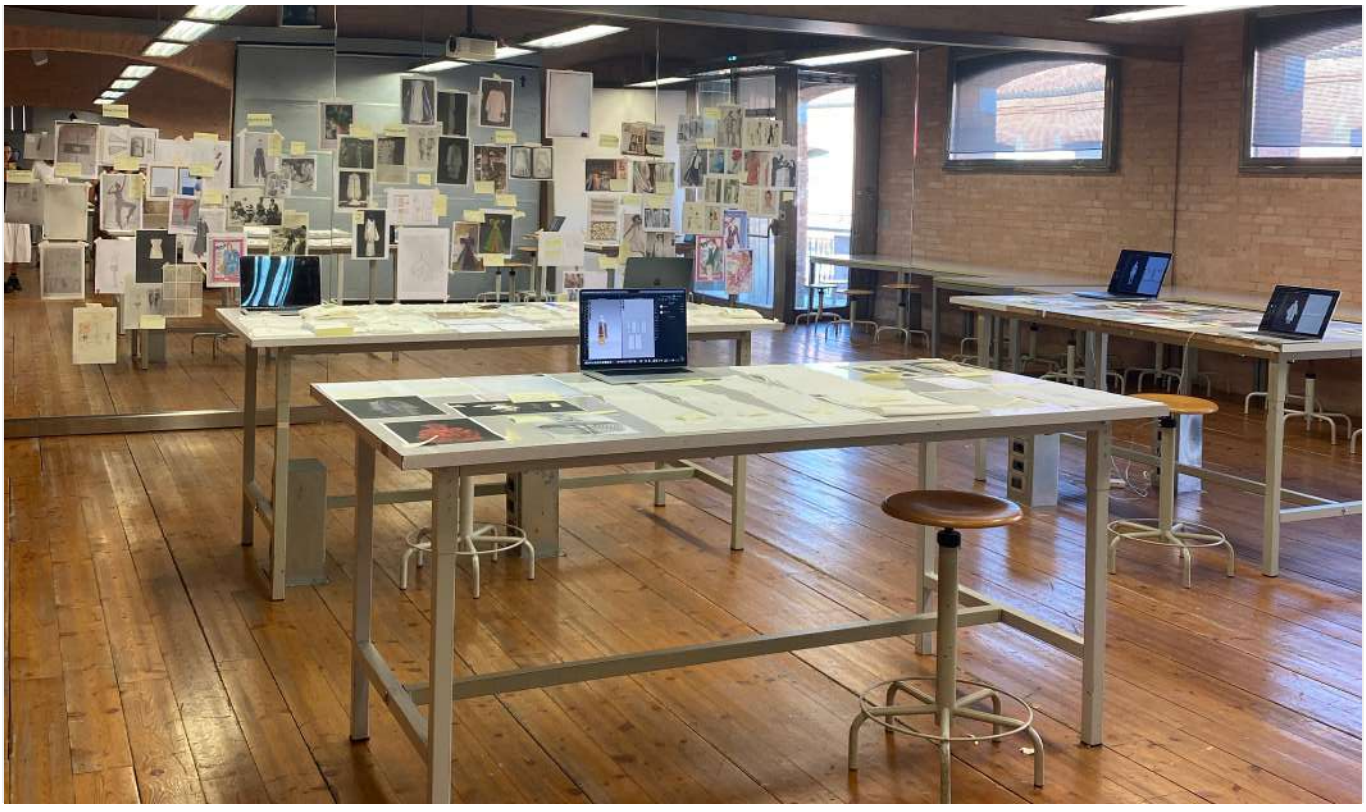

Fig. 04

Fig. 05

parts. The first part aims to describe the projects developed by each of the groups; regarding this aspect of data analysis, it is important to highlight that the aim of the workshop was not that of learning a new skill or collecting specific quantitative data. Rather, the activity functioned as a tool to activate conversations, analysis, and critical reflections on the topic of garment design and production; specifically, looking at how these processes are preserved within Italian fashion archives. As such, the discussion on the workshop's output resulted in a qualitative observation regarding the engagement of the participants and the development of each group's project. The second part of this conclusion deals with both the topic of garment design and production source (trying to define these materials in light of the research conducted) and the topic of fashion education, highlighting the potential of bringing the archives into the classroom, merging fashion design and digital skills. This final conclusive paragraph also highlights future implications of this type of approach for fashion studies and the fashion industry.

DISCUSSION ON THE WORKSHOP RESULTS

To conclude, a few aspects could be highlighted by describing the project developed by each of the groups and how these aspects merged within the collective discussion and mapping of the research. The scope of the workshop, in fact, was not to develop a perfect speculative 3D digital replica of the missing garment. Rather, the aim was to use iconographic and historical research, in combination with design-based approaches to activate critical reflection on the Italian fashion industry, its values and its dynamics.

Group 01, for instance, clearly applied fashion design competency to understand which printing matrix belonged to which part of the garment, together with historical and visual research that allowed for understanding the common shapes of the garments developed usually by Mariano Fortuny [Fig. 06]. Interestingly, their research also reflected on the topic of inspiration and cultural appropriation. Inspired by Tanveer Ahmed perspective on antiracist fashion design (Ahmed in Mareis & Paim, 2021) they questioned the uses and merge of symbols coming from specific cultures that were applied by Fortuny on garments for aesthetic purposes without specific contextualisation. Similarly group 07

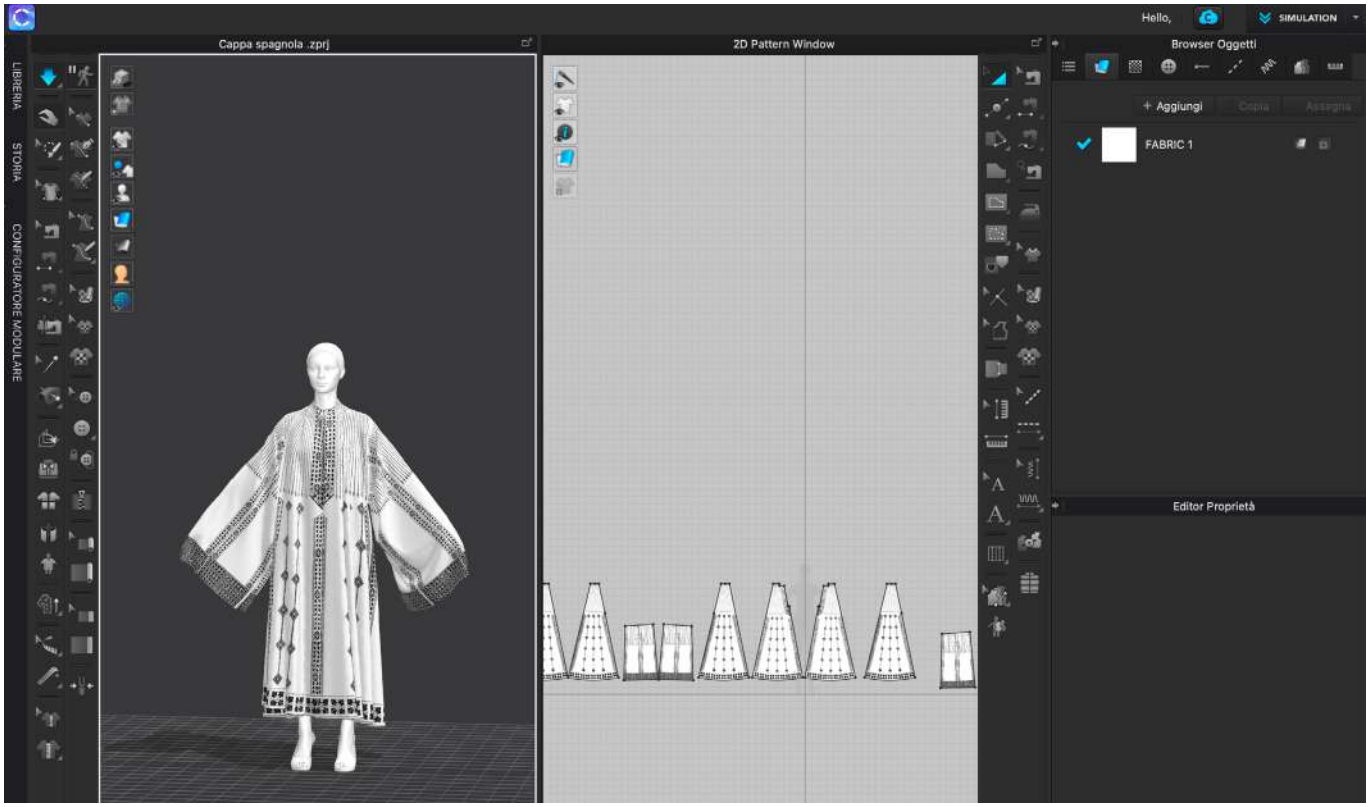

Fig. 06

questioned the iconography of the symbol drawn on the Krizia sketch (an illustration by Japanese graphic designer Tadanori Yokoo), figuring a smiling mouth with the tongue sticking out. They discovered that it represented a symbology from the iconography of the Hindu goddess Kalika and thus questioned its use by an Italian designer as cultural appropriation. Moreover, by studying the usual lines of the Krizia brand contemporary to the sketch, they were able to speculate the shape of the garment, understanding it might be a jumpsuit instead of a two-piece, as one would say at a first glance. The study of garment shapes was instead facilitated for group 06 who started from the manuscript Marfy patterns, however the group was confronted with the topic of size and body standardisation. Researching editorials and images from the time when their pattern was released (1990) they noticed a lack of diversity in body shapes, rather, the pattern was made for a specific client and thus had precise measures. The group also developed an in-depth research on the company Marfy and the relations with home-based professional dressmakers, noticing a lack of information on the subject. As a recurrent topic, lack of information was also a core aspect of the research developed by group 02 on another Krizia sketch. The group was not able to find the image of that exact garment within Krizia's collections of that time; this raised questions on whether the garment had actually been produced, if so, by whom? And for whom, a model or a specific client? Moreover, the group raised questions on the topic of authorship: historical and iconographic research led them to make the hypothesis that the creative director (better say stilista at that time, 1968) could have been Walter Albini. The topic of authorship was also raised by group 03 who dealt with the manuscript fabric sample book by Lanificio Paoletti. They noticed that the name of the textile designer was never mentioned. Overall, topics such as bodies, garment structure and shapes, design process and authorship were also raised by group 04 and 05 who worked starting from Roberto Capucci's heritage. Both groups were confronted with the pattern making process, specifically for the *Scatola* line, for the complexity of reconstructing certain volumes. Furthermore, they noticed a lack of information about seamstresses and makers who would work in the atelier and make the sketches into actual garments.

The workshop proved to be an effective tool for the reactivation of garment design and production

sources, functioning as a critical platform to engage with the Italian fashion industry and a selection of companies mapped within the RHITA project. The activities operated both as a living lab and as an educational framework, enabling participants to interrogate archival materials through practice-based methods. Furthermore, the workshop underscored that digital technologies in fashion archives should not be understood merely as innovative tools; rather, they require careful contextualisation and can serve as powerful instruments for the critical re-examination of fashion histories.

EDUCATION AND PHYGITAL: BRINGING FASHION ARCHIVES INTO THE CLASSROOM

Within this framework, the workshop can be considered also as an educational device that brings fashion archives directly into the classroom, positioning design and production sources as active tools for learning rather than as static objects of preservation. Considering that Italian fashion heritage still lacks a well established cultural policy for the constitution of a museum (Monti in D'Acunto et al., 2024, p. 343), the workshop overcomes this situation by letting different archives and collections communicate with each other for educational purposes. Moreover, as highlighted by Rodríguez Schön and Valle-Noronha (2025), one of the central challenges in engaging with fashion heritage lies in rendering visible the creative and technical processes behind garments, including their material construction and use. "Disegni, illustrazioni, e cartamodelli" responds to this challenge applying a workshop-led pedagogy to highlight design, production and processual knowledge. Recent scholarship in design education calls for a systemic shift in design pedagogies, emphasising alternative approaches that rethink how design history is taught, learned and experienced (Mareis & Paim, 2021). In the field of fashion, this shift involves moving towards the reform of fashion's "operating procedures", including how projects begin and how design practice is taught (Gardner & Mohajer va Pesaran, 2023).

Within this perspective, workshops function as spaces where imagination, speculation and material engagement can coexist, in line with the perspective of Rodríguez Schön and Valle-Noronha (2025): "The use of speculative methods to engage with archives emphasizes the use of imagination as a tool for resistance and archival reinvention [..]" (p.11).

The educational potential of such approaches is further expanded through the uses of digital tools, which might facilitate a critical analysis of fashion sources from more artistic and design based perspectives (Varisco et al., 2025). However, while digital technologies have only apparently transformed access to fashion heritage and enabled new forms of participation (Adil & Smelik, 2024; Pecorari, 2019), their application still raises critical questions regarding materiality, haptic experience and the risk of reducing archives to mere visual transpositions. Literature highlights both the advantages of digitisation, such as the preservation and accessibility of fragile garments and the use of 3D visualisation to explore objects from multiple viewpoints (Bloemberg, 2024; Kang & Lin, 2024), and its limitations, particularly the distancing from embodied and sensory knowledge. In response, recent design-based research stresses the need to move beyond simple digitisation towards phygital strategies capable of reactivating intangible knowledge related to manufacturing processes, movement and critical thinking (Calanca, 2020; Vandi et al., 2024).
The workshop "Disegni, illustrazioni e cartamodelli" is positioned in this in-betweenness, and aims to showcase the potential of merging digital tools with in-depth research, but also with analogical practices of pattern-making that are capable of engaging participants in an embodied experience.

Lastly, regarding the definition of fashion design and production sources, the article and the research conducted proves that there can not be an univocal way of defining such sources, since fashion processes are strongly fragmented, diverse and multifaceted. However, these materials can be categorised (as in the example of the case studies mentioned above: fashion sketches and illustrations; textile swatches; printing matrix; and manuscript paper patterns), they can be filed and described within fashion archives. Many of the groups discovered interesting aspects related to processuality that would have probably not been inquired in a garment-based research. The study of such document might lead to highlight complexities of the system, and can serve as sources to document the cultural value of production and manufacturing, but also its criticalities and damaging layers such as pollution, waste, un-ethical labour conditions and un-recognised authorships, all topics that need further investigation to "re-shape" the values of the italian fashion system.

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FOOTNOTES

[1] RHITA is a design-led research project that has been developed as a collaboration between five Italian public Universities (Università degli Studi della Campania "Luigi Vanvitelli", Politecnico di Milano, Università degli Studi di Firenze, Università Iuav di Venezia, Università degli Studi di Siena), within four different regions (Campania, Lombardia, Veneto, Toscana). RHITA is a PRIN 2022 PNRR research project, a project funded by the Italian Ministry of Universities and Research (MUR) as part of the Research Projects of National Interest program, supported by the National Recovery and Resilience Plan (PNRR).

[2] *d_archive* emerged in 2022 from the collective effort and ideas of four people with a common ground and long experience in 3D fashion design and development: Virgile Biosa, Erisa Ibrahimi, Martina Ponzoni and Daniele Scarante (Varisco et al., 2025).

[3] The Roberto Capucci Foundation was founded in 2005 is built around the Capucci Archive, its core heritage, which brings together an extensive and continuously expanding collection begun in 1951. The archive includes sculptural garments and haute couture creations, original sketches and drawings, colour and black-and-white illustrations, photographs, audiovisual materials, and a press archive. For further information see: https://siusa-archivi.cultura.gov.it/cgi-bin/pagina.pl?TipoPag=cons&Chiave=12663

[4] At present, the Centro Studi e Archivio della Comunicazione (CSAC), described in the previous chapter, still promotes research activities centred on building a major collection dedicated to art, photography, architectural drawings, design, fashion, and graphic design, alongside an active programme of exhibitions and scholarly publications. For further information see: https://www.csacparma.it/chi-siamo/

[5] Lanificio Paoletti is a historic Italian textile mill located in Follina (Treviso) specialised primarily in carded wool fabrics such as Shetland, Tweed and Harris-type cloths. Although today Lanificio Paoletti is a small-scale enterprise, it boasts over 230 years of history and has reached its tenth generation, with textile production continuously carried forward within the same family. The company develops two collections each year—Autumn/Winter and Spring/Summer—with the winter collection representing its core focus, reflecting its strong expertise in wool fabrics. For further information see: https://www.lanificiopaoletti.it/identita/storia/; the information has been collected also within an interview with Paolo Paoletti, currently CEO of the Lanificio Paoletti.

[6] The Museo Fortuny is located in Venice, at Palazzo Pesaro degli Orfei which has been Mariano Fortuny y Madrazo's home since 1898, and subsequently an atelier and even a small textile and clothing factory. The Fortuny Museum opened to the public in 1975, and in 1978 the acquisition of the ground-floor entrance completed the integrity of the entire complex. For further information see: https://fortuny.visitmuve.it/it/il-museo/sede/la-sede-e-la-storia/

CAPTIONS

[Fig. 01] Drawings, illustrations, and patterns brought in class for the workshop activity at Iuav University of Venice, June 2025.

[Fig. 02] Manuscript paper patterns and textile samples brought in class for the workshop activity at Iuav University of Venice, the students are observing the materials before choosing the one to work with, June 2025.

[Fig. 03] Work-in-progress pattern making phase during the workshop "Disegni, illustrazioni e cartamodelli", June 2025.

[Fig. 04] Collective mapping of the projects and final presentation of the workshop results, June 2025.

[Fig. 05] Workshop results, overview of the garments developed in 3D as output of the speculative research conducted on garment design and production sources.

[Fig. 06] Group 01 project output, 3D digital replica of a garment, resulted from their work on Marian Fortuny's printing matrix.

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DIMENSIONS OF TRANSITION

ENVIRONMENTAL, SOCIAL AND SYSTEMIC FASHION TRANSFORMATIONS

PATHS OF TRANSFORMATION:
SHAPING THE FUTURE OF ITALIAN FASHION

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Abstract

This article examines the ongoing transformations within the Italian fashion system through the findings of the national research project *ResHaping made in ITAly (RHITA)*, focusing in particular on the activities of the University of Florence Research Unit in Milestone 3 (M3). It interrogates the contemporary conditions under which Made in Italy can be reproduced and reformulated. Drawing on a critical review of the literature and a qualitative methodological design based on case studies, the research identifies three emerging transformative trajectories: circular systems, phygital scenarios, and informal education. The analysis shows that these trajectories do not operate additively, but rather through a relationship of co-determination: circularity requires informational infrastructures that make materials traceable and regenerable; the phygital dimension stabilizes and mediates such information through digital devices; and informal education enables its operational translation and the transmission of the skills necessary for their practical implementation. Through six case studies selected across production, services, and training, the article highlights the tensions among standardization, material variability, and situated knowledges that characterize contemporary Made in Italy. The contribution advances a systemic reading of the transformation of the Italian fashion sector, interpreting Made in Italy as a dynamic device in which material, information, and learning are continuously negotiated.

Keywords: *Italian fashion system, Fashion transformation, Circular practices, Phygital fashion, Informal education*

INTRODUCTION

Structured as a journey that was at once fluid and labyrinthine, *The Glamour of Italian Fashion 1945–2014* presented itself as one of the first major museum surveys devoted to Italian fashion from the post-war period to the present, constructing a genealogy of Made in Italy's contribution to fashion culture (Stanfill, 2015). In the Victoria & Albert Museum exhibition, this genealogy was anchored in a lexicon of quality and style – luxurious materials, textile expertise, regional manufactures – and, more generally, in the Italian industry's ability to convert territory and manual skills into an international brand (Victoria and Albert Museum, 2014). Taking the Florentine fashion shows of the early 1950s as the inaugural turning point, the exhibition traced trajectories of change through devices of visualization and mediation, including a digital map of spinning mills, workshops, and production clusters, before closing with a series of video interviews designed to address the trends set to redefine and shape the future of fashion in Italy. It is precisely in the shift between museological canonization and the documentation of ongoing transformations that the exhibition made a threshold legible: while establishing an identity lexicon of Made in Italy, it simultaneously made evident the emergence of constraints that today call its future into question: offshoring of production, environmental pressures, digital infrastructures, and new forms of supply-chain coordination. Moving within

this threshold, the article examines selected results of the national research project *ResHaping made in ITAly (RHITA) – Circular models for the heritage and manufacturing production of Italian fashion through digital inclusivity and conscious innovation*, which enabled the analysis of a range of practices, lexicons, and tools in response to specific transformations in Italy's fashion sector, bringing to light three trajectories of change: circular systems, phygital scenarios, and informal education. More specifically, circular systems are understood as reorganizations of practices oriented toward regeneration and sustainability; phygital scenarios as modes of integration between material and digital dimensions; and informal education as a set of learning practices that connect training contexts and production spaces, contributing to the dissemination of new skills within the sector and society. The contribution further emphasizes that these three categories do not operate by addition, but through interdependence: what enables one dimension may introduce constraints in another.

METHODOLOGICAL APPROACH

This contribution is situated within the national research project *RHITA* and focuses specifically on the activities carried out by the University of Florence Research Unit within Milestone 3 (M3): *Re-Shaping Fashion for Made in Italy.* The primary goal of M3 was the reformulation of the cultural and productive landscapes of Italian fashion through the integration and reinterpretation of the qualitative and quantitative data collected in the earlier phases of the project. M3 functioned as an analytical and modelling hub, connecting territorial investigations of production chains, human capital, and training pathways in order to outline an operational model capable of describing and orienting the transformations currently underway in fashion in Italy. From a methodological standpoint, M3 activities combined tools of critical and historical analysis with practices of structured and semi-structured empirical inquiry. These included the characterization of production chains across different regional contexts, the analysis of sustainable production practices, and the documentation of human capital through reporting activities. These materials were subsequently systematized through processes of data integration and modelling, with the aim not so much of producing an exhaustive mapping of the sector as of identifying recurring configurations, tensions, and emerging trajectories. The first phase of the research involved a review of the literature in Italian and English, using Scopus, Web of Science (WoS), and Google Scholar as primary databases. Their combined use made it possible to cover a broad spectrum of academic sources and specialist literature: WoS and Scopus provide access to high-quality peer-reviewed journals with broad disciplinary coverage, while Google Scholar makes it possible to intercept additional contributions (e.g., conference proceedings, book chapters) that are not always indexed by traditional databases. This combination, recommended in rigorous literature review methodologies, makes it possible to mitigate the coverage limits of individual databases and to broaden the retrievability of relevant contributions (Falagas et al., 2008; Haddaway et al., 2015). Alongside indexed sources, non-indexed sources (grey literature) – institutional reports, project documents, and professional publications – were also included in order to integrate contextual data and operational perspectives, reducing publication bias and improving the completeness and timeliness of the state of the art (Paez, 2017). In line with literature review guidelines, ex ante search and selection criteria, as well as inclusion/exclusion criteria, were defined (Snyder, 2019), ensuring transparency, traceability, and replicability of the process in accordance with systematic review protocols in the social sciences and management (Tranfield et al., 2003; Petticrew & Roberts, 2006). The research identified three transformative trajectories of the fashion system in Italy, adopted as working hypotheses to be examined against empirical materials:

1. circular systems: examines the introduction of circular practices aimed at strengthening sustainability;

2. phygital scenarios: addresses the growing integration between physical and digital dimensions in design and production processes;

3. informal education: focuses on the diffusion of innovative educational models that foster dialogue among learning environments, production spaces, and society.

Following the literature review and the identification of the three transformative trajectories, the research adopted a qualitative

methodological design based on case studies. The aim was not to test predefined hypotheses, but rather to deepen and articulate these trajectories through the observation of practices, organizational arrangements, and operational infrastructures concretely activated in different contexts. For each trajectory, two case studies were selected, identified through a preliminary mapping of production chains, services, and relevant actors, supported by a qualitative documentary analysis of publicly available and organization-produced materials (e.g., sustainability reports, technical sheets, certifications, websites, press kits, and project documentation). Documents were treated as data and analysed through iterative thematic content analysis to triangulate interview accounts and to substantiate process descriptions with verifiable traces (Bowen, 2009), alongside exploratory contacts with key stakeholders. Selection prioritized cases capable of representing different roles along the value chain (production, services, training), characterized by an adequate level of organizational maturity, here defined as the presence of sufficiently formalized and repeatable processes, routines, and coordination mechanisms enabling innovations to be implemented and stabilized in an observable and describable manner (Cohen & Levinthal, 1990; Lockamy & McCormack, 2004) and by sufficiently structured processes to be observed and described systematically. Additional selection criteria included the availability of verifiable data, informational accessibility, and openness to critical discussion. The case studies were investigated through semi-structured interviews with key representatives of the organizations involved, complemented by documentary and communicative materials produced by the same actors. Interviews (conducted online and audio-video recorded) followed a shared interview guide to ensure comparability, while retaining flexibility through probing questions to elicit trajectory-specific practices and issues (Kvale & Brinkmann, 2015; Galletta, 2013).Cross-case comparison made it possible to highlight recurrences, divergences, and tensions, progressively refining the conceptual boundaries of the three trajectories and supporting their definition as emerging analytical constructs. For the circular systems trajectory, the cases of Beste (including Beredo project) and DIFE were analyzed. Beste is a manufacturing company based in the Prato textile district1, engaged in developing practices for the regeneration of pre-consumer textile waste through the Beredo project, which integrates circularity, industrial symbiosis, and upstream supply-chain redesign. DIFE is an operator specialized in the management of industrial waste, including the treatment of textile waste, and represents a crucial intermediate node between production and recycling infrastructures, enabling observation of the role of service actors in activating circular strategies. For the phygital scenarios trajectory, the cases of FutureClo and Temera were selected. FutureClo is a Small and Medium-sized Enterprise (SME) founded in 2021 that operates according to a phygital logic, integrating advanced digital design and physical manufacturing and reversing the traditional sequence of the design process, in which the digital object precedes the material one. Founded in 2009, Temera is a company specializing in the implementation of RFID technologies along the luxury fashion supply chain, with a focus on traceability, anti-counterfeiting, and informational integration, offering an infrastructural and process-oriented perspective on the interaction between physical and digital dimensions. For the informal education trajectory, the cases of Lanificio Paoletti and ITS MITA Academy were analyzed. Lanificio Paoletti is a manufacturing firm founded in 1795 that, alongside production, develops practices of public openness and situated learning along its production line, transforming the factory into a temporary space for the transmission of knowledge. ITS MITA Academy is a foundation active in higher technical education for the fashion sector, operating as an institutional node capable of connecting schools, universities, companies, and local territories, and promoting training models oriented toward the integration of learning and production. Subsequently, the interview corpus was subjected to an exploratory lexical analysis using a reproducible Python workflow. Transcripts were pre-processed through lowercasing, punctuation removal, tokenization, and filtering via an extended stopword list; term-frequency tables were then computed and exported to support traceability and cross-trajectory comparison. In line with established approaches in computational text

1 Prato is one of Italy's major textile districts and has a long-standing association with fibre recovery and recycled-wool production ('cardato'), making it a relevant territorial context for observing circular practices in textiles.

analysis and computer-assisted qualitative inquiry, these outputs were used as an auditable heuristic to inform close reading and thematic interpretation – highlighting recurring terms and salient lexical clusters – rather than as a stand-alone validation procedure (Abram et al., 2020; Macanovic, 2022). Comparable text-mining pipelines have also been adopted in fashion-related research to map patterns in textual corpora and support interpretive claims about industry discourse and fashion narratives (Choi et al., 2021). Taken together, the six case studies were used to deepen and articulate the three transformative trajectories, enabling observation of different operational configurations and supporting a qualitative analysis of the transformations currently unfolding in the Italian fashion system.

TRANSFORMATIVE TRAJECTORIES

The Italian fashion industry did not emerge as the simple linear evolution of a tailoring tradition; rather, it took shape as a systemic response to a condition of profound historical discontinuity (Paulicelli, 2015). As White (2000) has shown, the *miracle* of Italian fashion is rooted in the rubble of the post-war period, when the need for economic reconstruction propelled the industrialization of artisanal know-how. In this phase, Made in Italy crystallized not only as a label of origin, but as a distinctive production model grounded in what Becattini (1979) termed the industrial district: a socio-economic system characterized by the interpenetration of local communities and firms. The strength of this model lay in *flexible specialization* and in a geographical polycentrism that turned regional identities into global competitive advantages (Merlo, 2003).
Yet this arrangement – based on tacit knowledge and fragmented supply chains – has, in many cases, become a form of structural rigidity when confronted with contemporary challenges.
The current twenty-first-century scenario presents striking isomorphisms with the post-war reconstruction period of the previous century. If, from 1945 onward, Italy was marked by the transition from a wartime economy to a consumer economy, the post-pandemic era is now urgently demanding a shift toward an economy of sustainability and the digital. We are facing what the literature describes as a twin transition, in which the digital revolution and the ecological imperative act as disruptive forces that render earlier value logics obsolete. The historical parallel suggests that, just as in the post-war period, the sector cannot now survive through mere marginal adjustments. What is required is an ontological restructuring of the concept of Made in Italy (Savi, 2023; Dellapiana, 2022).

The traditional narrative, focused exclusively on aesthetics and heritage, appears inadequate today (Barucco, Bulegato & Vaccari, 2020). As theorized by Rinaldi and Testa (2014), excellence must now integrate the ethical and environmental dimension as a non-negotiable prerequisite, transforming sustainability from a regulatory constraint into a driver of strategic innovation. The three transformative trajectories identified by the RHITA research – circular systems, phygital scenarios, and informal education – are situated within this landscape and aim to systematize approaches and practices.

CIRCULAR SYSTEMS

The first transformative trajectory, defined as circular systems, develops out of the debate on the circular economy in the fashion sector. In recent years, the literature has produced a broad and consolidated body of work, largely centered on closing material loops and optimizing environmental impacts through strategies such as recycling, waste reduction, product life extension, and the adoption of Life Cycle Assessment methodologies and environmental metrics applied to materials and processes (D'Itria & Colombi, 2024; Niinimäki et al., 2020). This orientation has enabled significant advances in measurement and in technical–operational solutions, often focused at the level of the product or the individual firm (Vezzoli et al., 2022). Alongside these approaches, part of the literature advances a more radical reading of circularity, understood not as a set of corrective practices but as a reformulation of the fashion system's operating logics (Cianfanelli, 2025). From this perspective, circularity is associated with a rethinking of the values that guide design, production, and consumption (Fletcher & Tham, 2019), as well as with the application of Systemic Design frameworks capable of intervening in organizational models and supply-chain relations, particularly in the context of SMEs (Barbero & Ferrulli, 2023). Despite these contributions, the literature points to a recurring limitation: circularity continues to be treated primarily as a technical problem – concerning materials, processes, and treatment technologies – while the dimensions of governance, coordination,

and infrastructuring that make such practices actually feasible and scalable remain less explored (Luible & Braumann, 2025; Whitty, 2021). Within this framework, the circular systems trajectory is taken as one of the ways through which the RHITA dispositif contributes to making matter legible, comparable, and transformable. Circularity is interpreted here as a systemic transformation that entails the reorganization of regenerative practices, evidentiary criteria, and distributed responsibilities, capable of reconfiguring the productive, organizational, and cultural arrangements of Made in Italy. From this standpoint, attention shifts from punctual solutions to the material and immaterial conditions that enable – or hinder – the integration of circular economy principles across the entire product life cycle. An effective circular transition requires the co-design of products, services, and infrastructures, as well as the realignment of incentives, skills, and practices toward durability, reuse, and intensified use. Circularity thus becomes observable not only in material choices and end-of-life strategies, but also in a constellation of infrastructural, relational, and regulatory factors that define the practical margins of regenerative practices.

This reading is corroborated by the analysis of the case studies of Beste2 and DIFE3, which make it possible to observe circularity as an operational configuration distributed along the supply chain. The Beste case shows how the continuity of material flows can be ensured within the same value chain through the Beredo project. The vertical integration of competencies and infrastructures enables the company to manage all phases of the process internally – from waste collection to regeneration and finishing – thereby ensuring high quality standards, flow traceability, and operational transparency. In this sense, Beredo is not merely a closed-loop recycling system, but a form of organizational innovation that strengthens the resilience and autonomy of the production system. The practices activated – from the recovery of high-value fibers to the creation of new textile compounds, and up to the reuse of waste in alternative sectors such as paper manufacturing – configure Beredo as a laboratory of systemic innovation and a model potentially replicable for other Made in Italy firms. The DIFE case, by contrast – an operator specialized in industrial waste management – allows observation of a segment often marginalized in analyses of circularity: the collection, sorting, and classification of pre-consumer waste. The interview highlights in particular the strategic importance of flow traceability and the quality of incoming deliveries, understood as indispensable conditions for ensuring the functioning and compliance of recycling chains with the required environmental and technical standards. DIFE acts as an intermediate node between production and treatment infrastructures, contributing to the construction of operational and informational connections without which circular strategies would remain difficult to implement.

Taken together, the two cases show that circular innovation depends not exclusively on technological solutions, but on a set of infrastructural, regulatory, and relational conditions that enable cooperation among actors and the stabilization of practices. From this perspective, circular systems emerge as a transformative trajectory capable not only of reducing environmental impacts, but also of redefining roles, responsibilities, and forms of value within the Italian fashion system.

PHYGITAL SCENARIOS

The second transformative trajectory, defined as phygital, is situated at the point where fashion increasingly becomes both an object and a process mediated by data, interfaces, and representational systems. The term phygital refers to hybrid configurations in which physical practices and artefacts remain central but are continuously augmented by digital layers (data, interfaces, simulations), reshaping design, production, and value regimes in fashion (Iannilli & Spagnoli, 2021; Vergine et al., 2019).Recent scholarship examines this shift through the introduction of technologies that redefine the phases of design, prototyping, production, and market relations: Digital Twins and iterative prototyping (Casciani, 2023); identification and traceability systems based on RFID and data management; applications of artificial intelligence for conceptual generation and the handling of complex information (Särmäkari & Vänskä, 2022); as well as immersive environments and modes of access that restructure experience, communication, and the symbolic value of the fashion product (Hajahmadi et al., 2024).

Within this framework, some contributions show

2 Online interview conducted on March 4, 2025.

3 Online interview conducted on March 6, 2025.

how digitalization reconfigures supply chains and business models by shifting points of control and redefining the timing, standards, and skills of work (Casciani, Chkanikova & Pal, 2022). More recent research focuses instead on the cultural and identity implications of these transformations (Wallin, 2025), questioning the role of artificial intelligence in redefining authorship, creativity, and professional subjectivities (Quartu, 2024), as well as the theoretical frameworks that connect the phygital condition to post-digital and posthuman perspectives (Smelik, 2021). Here too, however, the literature tends to assess digital transformation primarily in terms of efficiency (Bertola & Teunissen, 2018), optimization (Bottani et al., 2023), and cost reduction (Denaro, 2023), while its relationship with the historical, material, and cultural conditions that have traditionally generated value in Italian fashion remains less thoroughly investigated.

Within this trajectory, Italian fashion and Made in Italy take shape as a continuum in which materiality does not disappear, but is constantly augmented, rewritten, and hybridized by the digital. Dematerialization does not coincide with abandoning the physical; rather, it entails replacing part of material production with symbolic, iterative, and informational processes through which value, authenticity, and belonging are redefined, also via new forms of certification, narration, and remediation of the manufactured object. This interpretation is borne out by the case studies of FutureClo4 and Temera5, which allow two complementary articulations of the phygital scenario to be observed. In the FutureClo case, the interview highlighted a creative workflow that begins with the dematerialization of the fashion product: design takes shape through parametric avatars, digital textures, and digital twins that precede the garment's material existence. Only at a later stage is this immaterial dimension translated into the first physical prototype, which is not discarded but integrated into a collaborative process of oversight and optimization. This methodological inversion does not represent a break with Italian manufacturing tradition, but rather a reworking of it: the digital does not replace artisanal knowledge, but enters into dialogue with it, generating reciprocal contamination between material and immaterial competences. As the interview suggests, 3D design practices are orchestrated by pattern-makers and designers working within a hybrid logic, capable of shaping the digital domain and translating it seamlessly into the physical one, thereby reinforcing the identity of Made in Italy. In this context, 3D files and renderings do not function as merely representational tools, but as productive agents participating in the garment's generation. The digital twin does not simulate the object; it co-produces it, transforming the traditional relation between original and copy. Yet this inversion does not subordinate the physical to the digital; rather, it establishes an ontological co-dependence between the two dimensions, which define and strengthen one another. The Temera case, by contrast, makes it possible to observe the phygital scenario from an infrastructural and process-oriented standpoint. The company adopts an approach based on mapping production flows, which precedes and guides technological customization, reversing the traditional technology-first logic. Through informational integration, the fashion artifact is extended into the digital domain and becomes a communicative node capable of conveying data, certifications, and traceability. As CEO Arcangelo D'Onofrio emphasizes, the phygital transformation entails the material object acquiring the capacity to communicate, establishing an ongoing dialogue with users, firms, and control systems. In this sense, the garment no longer exists solely in its materiality, but as an interface between tangible and intangible, between physical experience and information. Taken together, the two cases show that the phygital scenario cannot be reduced to technological innovation alone: it configures a cultural and organizational transformation that redefines competences, roles, and forms of value. The hybridization of physical and digital, when anchored in responsibility toward materiality and in the specificities of Made in Italy, opens onto new forms of qualified work and value creation, preventing digitalization from translating into a new immaterial consumerism or into technological exclusion.

INFORMAL EDUCATION

The third transformative trajectory concerns informal education and, more broadly, the ways in which the fashion sector generates, updates, and transfers competences in contexts that cannot be traced exclusively to institutional channels of

4 Online interview conducted on March 24, 2025.
5 Online interview conducted on March 12, 2025.

education and training. Scholarship on fashion education has often focused on formal institutions and academic models (Lupano & Vaccari, 2014), privileging schools, universities, and structured programmes as the primary sites for knowledge transmission. More recent research, however, has begun to foreground hybrid and distributed practices in which learning and production intertwine in non-linear ways: laboratories, industrial districts, territorial networks, and collaborations among research, industry, and professional communities (Carini, Mazzucotelli Salice & Cornaggia, 2025; Franzo & Moradei, 2021).

In this direction, several contributions emphasize the role of situated learning and the urban and territorial dimension as a diffuse educational infrastructure (Faiferri, Bartocci & Pusceddu, 2017), while others propose a reconfiguration of industrial districts into more advanced forms, in which culture and manufacturing operate as interconnected systems (Sacco & Tavano Blessi, 2005). In the background, the notion of a learning economy has long highlighted how the competitive advantage of productive systems depends on the capacity to combine heterogeneous competences in environments that are not fully formalized, characterized by continuous learning and interaction among diverse actors (Lundvall & Johnson, 1994). Within this framework, informal education is understood here as a situated and hybrid learning regime in which sites of production and sites of education increasingly overlap. Laboratories, districts, research–industry collaborations, learning-by-doing practices, apprenticeship, and forms of work-integrated learning constitute operational educational infrastructures capable of responding to the growing technological, cultural, and organizational complexity of the fashion sector. This trajectory does not merely address a training deficit; it redefines the very conditions of knowledge production, recognizing value in experience, practice, and the relational dimension of learning. This interpretation emerges clearly from the analysis of the case studies of Lanificio Paoletti[6] and ITS MITA Academy[7], which represent two distinct yet complementary configurations of informal education. Lanificio Paoletti offers a paradigmatic example of how a production space can be transformed into a learning environment. Alongside full-cycle production of yarns and fabrics in carded wool, the company has progressively integrated contemporary tools and languages while preserving traditional knowledges. As the interview indicated, starting in 2013 the mill began periodically opening its premises to the public through the initiative La Via della Lana, organizing guided tours, exhibitions, seminars, and educational activities involving designers, artisans, students, and local communities. In this context, the factory becomes a temporary incubator of knowledge, where production processes can be directly observed and collectively discussed. This openness aligns with a broader phenomenon observable in Italy: the reconfiguration of fashion production sites, often located in peripheral or district areas, as non-conventional learning environments (Franzo, 2022). These spaces host not only sector professionals but also citizens, tourists, and consumers, fostering greater awareness of the environmental, social, and cultural implications of fashion production.

The second case study, ITS MITA Academy, represents an institutional configuration of informal education. A foundation active in Tuscany in the field of higher technical education for the fashion sector, ITS MITA stands out for its active collaboration with the University of Florence, which has made it possible to combine a strongly professionalizing educational offer, designed to bridge the gap between formal schooling and the skills required by companies, with research and experimentation activities. Operating in a region historically devoted to textile and leather manufacturing, the institute has contributed to building an educational and productive ecosystem connecting upper-secondary schools, universities, companies, local authorities, and institutional stakeholders. The result is a region-wide distributed laboratory in which students, teachers, university researchers, professionals, and firms collaborate through experiential learning practices, interdisciplinary experimentation, and knowledge exchange. Students gain access to advanced technologies, explore themes related to sustainability, innovation, and circular design, and develop competences that are immediately transferable to the labour market. In this sense, ITS MITA acts as a catalyst for educational innovation, promoting active and contextualized pedagogical models capable of responding to

6 Online interview conducted on April 1, 2025.
7 Online interview conducted on March 25, 2025.

the transformations currently reshaping the fashion system. Despite the differences in their configurations, both cases demonstrate the capacity to redefine roles and operational boundaries, functioning as dynamic platforms for learning. Rooted in strong technical know-how and in a structured relationship with the territory, Lanificio Paoletti and ITS MITA operate as *crafts of combination* (Lundvall & Johnson, 1994), spaces in which heterogeneous competences converge and are translated into forms of collective knowledge. From this perspective, Italian industrial districts, often described as being in productive decline, emerge as privileged contexts for experimenting with new educational pathways, transforming into advanced cultural hubs.

ANALYSIS AND CONCLUSIONS

Read separately, the three strands examined offer only partial responses to the transformations underway in the Italian fashion system: circularity tends to focus primarily on material dimensions and environmental metrics; the phygital tends to privilege the adoption of technologies and process optimization; informal education places the transmission and hybridization of knowledges at its center. The central issue that emerges from the research, however, concerns not only what changes, but which regimes of truth and which operational rationalities take hold when circularity, the phygital, and informal learning are named and activated as inevitable horizons of transformation. It is at this juncture that the RHITA research has made otherwise implicit connections legible, showing how the interdependence among the three trajectories takes on a structural character. The circular systems trajectory, when regenerated material re-enters the supply chain in a stable way, repeatedly encounters a recurring problem: matter requires a continuous informativity, understood as memory of the material, process history, end-of-life possibilities, and reuse potential, which it does not intrinsically possess. In this sense, the phygital trajectory becomes a necessary condition for making such information visible, stabilized, and transferable, transforming the tangible into a site of mediations that render it verifiable and legible. Informal education enters this relation as a condition of practicability and translation. Practices of regeneration, sorting, separation, quality verification, and the adoption of new procedures require situated competences that are often not fully codifiable and are learned and transmitted through practice. At the same time, the stabilization of phygital mediations requires operational data literacies, including reading indicators, filling in technical sheets, using standards, and ensuring interoperability, which can rarely be acquired exclusively through formal channels. Where the phygital tends to formalize and stabilize information, circularity demands ongoing work of material interpretation and operational adjustment. It is precisely at this threshold that a tension characteristic of Made in Italy becomes visible: what makes matter traceable and comparable, namely standards, informational schemas, and classifications, may come into friction with material variability and the heterogeneity of production contexts, especially where value has historically been tied to processes, competences, and knowledges that exceed full standardization. From this perspective, the three trajectories cannot be understood as a simple sum of circular practices, phygital tools, and informal education experiences, but as a continuous negotiation among evidentiary requirements, design mediations, and operational capacities.

Further evidence supporting this reading emerges from the lexical analysis of the interviews. Even in the absence of a single identical term running across all cases, a recurring core of words can be identified that cuts across multiple trajectories and signals a shared terrain of problematization: companies (Temera, ITS MITA, Lanificio Paoletti, DIFE, Beste), research (ITS MITA, Lanificio Paoletti, Beste), product (FutureClo, Lanificio Paoletti, DIFE), and world (FutureClo, ITS MITA, Lanificio Paoletti). This core can be interpreted as an index of the stabilization of a field of sayability (Foucault, 1969), within which the transformation of Made in Italy is articulated as an issue situated at the intersection of organization, competences, and materiality. Alongside this shared base, each trajectory produces specific lexical condensations. In the phygital, terms linked to technological mediation and physical–digital reconfiguration recur, with a more systemic lexicon in Temera (supply chain, market, luxury) and a more design-oriented one in FutureClo (digital, design, 3D, physical). In circular systems, by contrast, a vocabulary of material management and operational constraints becomes concentrated, in which the lemma waste runs through both Beste and DIFE together with terms such as management, rules, and technologies/solutions. In informal

education, finally, a lexicon of hybridization between enterprise, work, and training prevails, with bridging terms such as companies, research, training, process/production, and with a strong material anchoring in the Lanificio Paoletti case (wool, fabrics, product). Taken together, these recurrences and lexical differences reinforce the contribution's central hypothesis: the three trajectories do not operate additively, but through co-determination. They share a minimal lexicon that makes a common discussion of Made in Italy's transformation possible, while simultaneously producing specializations and misalignments that make visible the tensions through which RHITA attempts to render such transformations practicable, verifiable, and transferable. In this sense, the value of the proposed model lies not in defining closed solutions, but in making observable the material, informational, and educational conditions through which the Italian fashion system is redefining its horizons of the future. From this perspective, Made in Italy emerges neither as a heritage to be preserved nor as a model to be optimized, but as a system in continuous transformation, whose capacity for the future depends on the dynamic negotiation among matter, informational mediations, and situated learning practices.

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WASTE ECOLOGIES.

CIRCULAR PATHWAYS RESHAPING ITALIAN FASHION MANUFACTURING

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Abstract

The ecological transition is compelling the Made in Italy fashion and manufacturing ecosystem to confront the material and organizational implications of circularity. Pre- and post-consumer waste streams—long overlooked or treated as residual—are becoming strategic sites for innovation, revealing both structural vulnerabilities and untapped opportunities within Italy's specialized industrial districts. This article traces how emerging European regulations, evolving infrastructural capacities, and regenerative design approaches are reshaping traditional production models, challenging established value chains while enabling new forms of material responsibility. By integrating a multi-scalar perspective on waste generation and recovery, the study highlights the systemic reconfiguration underway and argues that the future competitiveness of Made in Italy depends on its ability to transform waste into a driver of ecological and industrial renewal.

Keywords: *Waste Ecologies, Circular Fashion Manufacturing, Made in Italy, Design for Circular Transition, Territorialized Production Systems*

INTRODUCTION: WASTE AS A STRATEGIC LENS FOR CIRCULAR TRANSITION

The ecological transition is compelling the Italian fashion manufacturing system to undergo a profound transformation that simultaneously affects materials, processes, infrastructures, and organizational models. The adoption of the EU Strategy for Sustainable and Circular Textiles and the introduction of Extended Producer Responsibility (EPR) (European Commission, 2022; Köhler et al., 2021) mark a structural shift in European policies, steering the sector toward production models required to address the systemic complexity of waste in relation to material flows (Obregón & Danies, 2024) and treatment infrastructures (Sandin & Peters, 2018; Kirchherr et al., 2017). At the same time, growing consumer awareness (Niinimäki, 2020; Henninger et al., 2016) and the increasing pressure exerted by new traceability mechanisms fosters the need to rethink fashion products in their entirety, from design and development to end-of-life (EEA, 2025; Mishra et al., 2021;Fletcher, 2013).

This contribution is situated as part of the RHITA – Reshaping Made in Italy through Circular Models and Conscious Innovation project, contributing in particular to the activities of Milestone 3 (M3) – Redesigning Fashion for Made in Italy. This milestone aims to reframe the cultural and productive landscapes of Italian fashion across the four regions involved in the project (Campania,

Lombardia, Veneto, Toscana) through an integrated reading of manufacturing systems, human capital, and material competences, in relation to the challenges posed by ecological and digital transitions. Building on territorial investigations developed in earlier phases, M3 compares and interprets local production configurations in order to identify transformation trajectories capable of reshaping manufacturing models, inter-actor relations, and the design and operational practices that sustain the Made in Italy fashion system. In this framework, the article addresses how these models are changing—and how they should further evolve—to respond to sustainability and circularity imperatives, with specific attention to the redesign of production systems and the material ecologies that structure their functioning.

In the Italian case, these transformations acquire a specific relevance as they are embedded in a historically territorialized production system (Becattini, 1991; 1998), characterized by strong manufacturing specialization, dense networks of interdependent firms, and a high concentration of material competences (Bellandi et al., 2021; Mazzoni, 2020). As discussed in the following section, this configuration represents both a strategic asset and a source of vulnerability in the transition toward circular models, making the role of infrastructures, forms of industrial coordination, and governance arrangements especially visible and consequential.

Within these premises, the article adopts waste as a key interpretative lens for understanding the transformations currently reshaping Italian fashion manufacturing. Waste makes visible the interdependencies between production quality, material complexity, and infrastructural capacity, bringing to the surface tensions and misalignments that remain largely obscured in analyses focused exclusively on products, processes, or technologies, yet are central to the redesign of production systems from a circular perspective (Tufarelli et al., 2025).

Pre-consumer waste—generated during cutting, assembly, finishing, and quality control phases—highlights the operational relations that structure territorial manufacturing systems, while post-consumer waste streams expose the limits of collection and sorting infrastructures, increasingly strained by the heterogeneity of materials entering the global market. The imminent introduction of EPR for textiles further amplifies these criticalities, positioning waste as a strategic node through which shifting responsibilities, competences, and roles along the entire product life cycle can be examined. On this basis, the article adopts the perspective of waste ecologies to interpret the ongoing reconfiguration of Italian fashion manufacturing. Looking at the system through the lens of waste means conceiving it as a point of condensation of complex socio-material relations, in which design decisions, production arrangements, infrastructural capacities, and regulatory frameworks coexist, mutually shape one another, and evolve over time. In this sense, choosing ecologies entails shifting attention from isolated objects to the dynamic and situated processes through which circularity takes form within specific territorial contexts.

PRODUCTIVE ECOLOGIES OF MADE IN ITALY FASHION: INDUSTRIAL STRUCTURE AND EMERGING TENSIONS

Made in Italy fashion manufacturing has historically been grounded in a strongly territorialized production structure, characterized by specialized industrial districts, dense subcontracting networks, and a pronounced division of labor by production phases. This configuration has long been interpreted as one of the main sources of competitiveness of the Italian system, as it has enabled high levels of manufacturing quality, production flexibility, and responsiveness to market demands (Becattini, 1998; Belussi & Sedita, 2010). Today, however, the ecological and circular transition places under pressure precisely those arrangements that have historically sustained this model, calling for a critical re-reading of its industrial architectures.

Italian fashion districts can be understood as complex productive ecosystems in which geographical proximity facilitates the circulation of tacit knowledge, technical specialization, and informal forms of cooperation among firms (Becattini, 1991; Bellandi et al.,2021). In these contexts, product quality cannot be attributed to a single actor, but rather emerges from the interaction of multiple subjects and manufacturing phases distributed along the production system. While this articulation constitutes a strength in terms of material excellence, it simultaneously produces a fragmentation of responsibilities that obscures the relationships between design decisions, production processes, and downstream

material consequences (Bressanelli et al., 2022). Over time, and particularly within the luxury and premium fashion segments, this district-based structure has increasingly been overlaid by the presence of industrial holdings and integrated groups coordinating brands, suppliers, and subcontractors through vertically oriented governance logics (Djelic & Ainamo, 1999; Tokatli, 2014). These actors play a central role in defining quality standards, production timelines, and compliance requirements, introducing control and coordination mechanisms that coexist—often in tension—with the autonomy of small and micro-enterprises operating within districts (Canello et al., 2025). The result is a hybrid configuration (Giuliani & Rabellotti, 2017; Conti & Franzo, 2020), in which informal coordination based on trust and proximity coexists with centralized decision-making architectures and industrial planning imperatives.

This hybridization has profound implications for the implementation of the circular transition. On the one hand, productive specialization and territorial proximity enable material experimentation and the recovery of pre-consumer waste, particularly in districts with a long-standing tradition of fiber regeneration like Prato (Bressanelli et al., 2022; Tufarelli, 2022). On the other hand, the growing distance between design, commissioning, and manufacturing execution tends to generate misalignments that are reflected in material complexity, assembly systems, and difficulties in managing waste at end-of-life (Tufarelli et al., 2025; Niinimäki et al., 2020). From this perspective, the industrial structure of Made in Italy appears highly effective in terms of product quality, yet less equipped to address the systemic implications of circularity across the entire product life cycle.

A further tension concerns the relationship between production and consumption. Italian manufacturing continues to generate materials and products characterized by high quality standards, while post-consumer waste streams re-entering collection and sorting systems increasingly reflect the heterogeneous composition of the global market, dominated by synthetic fibers, complex blends, and low-durability products (Sandin & Peters, 2018; Henry et al., 2019). This qualitative discontinuity introduces a structural short-circuit: the industrial competences and infrastructures are only partially aligned with the complexity of the materials that must now be managed.

Taken together, these elements outline an industrial structure traversed by deep tensions between specialization and fragmentation, proximity and centralization. Within this framework, the ecological transition is understood as a process of systemic reconfiguration involving roles, responsibilities, and relationships across the entire productive ecosystem (Geels & Schot, 2007; Köhler et al., 2022). Indeed, the tensions embedded in Italian fashion manufacturing remain difficult to grasp when analyzed exclusively through conventional categories such as supply chain, process, or technology.

It is precisely at the point where these configurations generate residues, excesses, and material blockages that the contradictions of the system become most visible. Waste thus emerges as a privileged analytical site in which design decisions, organizational arrangements, infrastructural capacities, and regulatory frameworks condense. On this basis, the following section introduces waste ecologies as an analytical lens capable of rendering intelligible the ongoing reconfigurations of Italian fashion manufacturing, shifting attention from isolated objects to the socio-material relations that structure their existence.

TOWARD WASTE ECOLOGIES: THEORETICAL FRAMEWORK

The growing attention to circularity in the fashion sector has generated an extensive body of study aimed at making visible the causes and consequences underlying the urgency of the ecological transition (Mishra et al., 2021; Abate et al., 2023; Odabasi et al., 2023). Within this debate, an increasing strand of the literature questions the interpretation of waste—both from production and consumption—as a problem to be contained or optimized, as well as its residual positioning to the processes and relations that generate it (Binotto & Payne, 2017). Studies on circular transition of fashion show instead that waste does not emerge in isolation, but constitutes the outcome of endemic conditions that permeate the entire system, reflecting deep structural dynamics (Kirchherr et al., 2023; Fletcher & Tham, 2019).

Waste materializes within distributed configurations operating simultaneously at the micro level—through design decisions, production practices, and consumption habits; at the meso level—across subcontracting networks, industrial

districts, and inter-firm coordination mechanisms; and at the macro level—through European policies, extended producer responsibility schemes, and national industrial strategies (Tufarelli et al., 2025).
The perspective of *waste ecologies* adopted in this contribution is grounded in a body of studies that has, over the last two decades, challenged anthropocentric and instrumental conceptions of matter, emphasizing instead the active, relational, and processual nature of material systems. Within new materialist and posthumanist debates, matter is understood as a dynamic participant in socio-technical and ecological processes (Bennett, 2010; Coole & Frost, 2010). From this standpoint, waste emerges as a material configuration endowed with a specific form of agency, capable of shaping practices, infrastructures, and decision-making processes through its persistence, mobility, and resistance to containment (Bennett, 2020). Waste materials—fibres, blends, residues, micro-components—exert constraints and affordances that actively condition what forms of circularity can be enacted and stabilized within specific contexts.
This relational understanding of material agency resonates with Ingold's conception of materials as processes rather than objects. Ingold (2012) argues that materials should be understood through their ongoing trajectories of transformation, circulation, and entanglement. Applied to fashion manufacturing, this implies reading waste not as the terminal stage of a linear lifecycle, but as a moment within a broader material metabolism in which fibres, chemicals, infrastructures, and practices continuously interact and evolve.
Complementing this view, actor–network theory further supports an ecological reading of waste by conceptualizing production systems as assemblages of heterogeneous actors—human and non-human—whose relations co-produce material outcomes (Latour, 2005). Within such assemblages, waste operates as a mediator rather than an exclusive outcome: it connects design decisions, manufacturing practices, regulatory dispositifs, and infrastructural capacities, making visible the points where these relations align or fracture. This interpretation resonates with recent fashion studies scholars that also attribute agency to materials within socio-technical processes. Payne and Smelik (2024), for instance, show how textile fibers participate in planetary material flows that shape ecologies, practices, and infrastructures (Hetherington, 2004; Hawkins, 2006; Gregson & Crang, 2010). In continuity with new materialism and posthumanist approaches (Bennett, 2010; 2020), waste is therefore conceptualized not as inert residue, but as an active node within broader socio-material metabolisms, encompassing dispersed microfibers, contamination, recycling infrastructures, and regeneration processes.
In the fashion sector, waste production exposes organizational rigidities, material incompatibilities, and infrastructural limits, while many circular innovations—such as fiber-to-fiber recycling or design for disassembly—remain confined to niche contexts in the absence of favorable systemic conditions for their stabilization and diffusion. Even apparently marginal elements, including sewing threads, micro-components, or adhesives that prevent disassembly, emerge as critical disablers of circularity, testing the coherence between design decisions, infrastructures, and regenerative capacities (D'Itria & Trejo Machin, 2024).
This multi-level reading exposes the limits of the linear approach that has historically segmented the fashion system into discrete phases—make, take, waste—producing a disconnection bias that obscures continuity, responsibility, and interdependence across the product life cycle (Whitty, 2021; Voulvoulis et al., 2022). These limits become particularly evident in territorially embedded production systems, where supply chain fragmentation, regulatory misalignment, and infrastructural inadequacies—especially in relation to advanced recycling— further complicate the implementation of integrated circular models (Bocken et al., 2016; Ritzen & Sandström, 2017).
From this perspective, waste makes visible the conditions under which circularity becomes practicable—or, conversely, where it comes to a halt—opening up the investigation of situated ecologies of waste that illuminate both the limits and the possibilities for reshaping the fashion system within the circular transition. Rather than abstracting waste from its contexts, the notion of waste ecologies foregrounds how material properties, territorial infrastructures, and organizational arrangements co-evolve, shaping the concrete conditions under which circularity becomes practicable—or remains structurally blocked—in fashion manufacturing systems.
In this contribution, waste ecologies are thus defined as situated socio-material configurations in which waste is generated, negotiated, transformed,

and valorized through the interaction of design decisions, manufacturing arrangements, infrastructural capacities, regulatory frameworks, and material properties. They are not typologies of waste, but relational fields that reveal the conditions under which circularity becomes practicable, conditionally enabled, or structurally blocked within territorially embedded production systems.

WASTE ECOLOGIES SHAPING FASHION MANUFACTURING

This paper introduces waste ecologies as an analytical lens to investigate the circular processes progressively reshaping Italian fashion manufacturing. Waste ecologies are understood as socio-material configurations through which waste is generated, classified, transformed, and rendered—or not rendered—valuable within specific productive and territorial contexts.
This section develops waste ecologies as a conceptual device grounded in empirical observation of Italian fashion manufacturing systems. They emerge as analytical configurations derived from the qualitative interpretation of empirical materials collected within the RHITA project, including semi-structured interviews with manufacturers, brands, waste management providers, and territorial actors, as well as the analysis of policy documents and technical reports.
Within the empirical framework of this study, waste is approached as an analytical entry point through which to examine the co-evolution of materials, practices, infrastructures, organizational arrangements, and regulatory frameworks. Tracing waste across production, selection, and treatment contexts enables the identification of sites where circular transition is negotiated, constrained, or interrupted.
From this perspective, waste functions as a methodological device that renders visible tensions within manufacturing systems: situations in which infrastructural capacities prove insufficient, material compositions are misaligned with available technologies, regulatory frameworks encounter operational limits, or, conversely, context-specific opportunities for circular innovation emerge.
Rather than treating circularity as an intrinsic property of materials or systems, the analysis conceptualizes it as a relational and situated condition, contingent upon the often-precarious alignment between design decisions, production capacities, and territorial arrangements.

On this basis, the following subsection operationalizes the concept by identifying recurrent waste ecologies within Italian fashion manufacturing. These configurations should not be read as fixed typologies, but as analytical arrangements that illuminate different conditions of possibility for circularity. They indicate where circularity is already practicable, where it is conditionally enabled through organizational coordination, where it is structurally obstructed, and where design can intervene as a critical lever of transition. Taken together, these waste ecologies shift analytical attention from isolated materials to the relations that render them regenerable or not; from universal solutions to situated and territorialized trajectories; and from waste management to the systemic reconfiguration of fashion manufacturing as a whole.

PRE-CONSUMER INDUSTRIAL WASTE ECOLOGIES

These ecologies represent the most structured and historically consolidated configuration within Italian fashion manufacturing, especially relevant for natural fibers, such as cotton, silk and wool, whose pre-consumer residues retain strong regenerative potential and may also generate limited economic returns. Pre-consumer waste emerges within controlled and highly specialized production processes, where the relative material purity and traceability, together with territorial proximity between waste generation and treatment, enable forms of recovery and reintegration. In this context, waste regenerability is directly shaped by process design: quality standards and technical specifications significantly influence both the quantity and the quality of residues. This ecology is therefore generally enabling circularity, provided that material architectures and operational logics remain aligned with available infrastructural capacities.

CONSORTIAL AND DISTRICT-BASED RECYCLING ECOLOGIES

In these configurations, waste is reorganized through collective mediating devices—such as consortia, district-based platforms, and specialized operators—that connect production and regeneration. Circularity here emerges from territorial and institutional coordination, supported by shared standards, semi-institutional governance, and localized infrastructures. These ecologies make explicit that circular transition cannot be reduced

to technological solutions alone, but depends on fragile socio-technical alignments between materials, volumes, and processing capacities. As a result, they are conditionally enabling and particularly vulnerable to increasing material complexity and flow discontinuities.

POST-CONSUMER AND SORTING ECOLOGIES

Post-consumer ecologies represent the most structurally problematic configuration within Italian fashion manufacturing. They are characterized by high material heterogeneity, limited traceability, and a pronounced spatial and organizational separation between sites of production and sites of consumption. This disconnection exposes a deep asymmetry between the material quality embedded in Italian manufacturing processes and the composition of post-consumer flows entering collection and sorting systems. These flows are increasingly dominated by synthetic blends, low-durability garments, complex finishes, and multi-material assemblies that resist separation and compromise material purity. As a result, post-consumer waste systematically exceeds the technological and organizational capacities of existing collection, sorting, and recycling infrastructures, which remain largely calibrated to more homogeneous and predictable material streams.

In this configuration, circularity is not merely difficult to implement but structurally undermined: the misalignment between upstream design logics, globalized consumption patterns, and downstream infrastructural capacities produces waste streams that are largely incompatible with regenerative pathways. Post-consumer ecologies thus reveal the limits of the current circular regime, showing how circular ambitions collapse when material complexity, scale, and infrastructural readiness fail to converge.

BRAND-LED AND ORGANIZATIONAL WASTE ECOLOGIES

Particularly relevant in the mid-to-high-end and luxury segments, these ecologies are defined less by the material visibility of waste than by governance arrangements imposed by commissioning brands. Waste management is structured through internal protocols, traceability systems, residue selection criteria, and stable supplier relationships that reflect upstream decisions regarding aesthetics, performance standards, and quality requirements established by brands.

In these configurations, waste does not directly inform design choices; rather, it materializes as an organizational and material consequence of decisions taken earlier in the process. A critical issue concerns the asymmetric distribution of responsibility: while brands retain control over design decisions, material selections, and quality standards, manufacturing SMEs are often required to absorb the operational and environmental implications of these choices. Subcontractors are thus compelled to accommodate highly impactful design requests, even when these increase waste volumes or undermine their regenerative potential. As a result, these ecologies are selectively enabling: they may support circular practices within tightly controlled and brand-governed perimeters, yet they remain difficult to scale systemically due to the misalignment between decision-making power and responsibility for waste management.

CRITICAL MISALIGNMENT ECOLOGIES

Transversal to all other configurations, these ecologies take shape where design decisions remain disconnected from manufacturing constraints and end-of-life infrastructures. Complex assemblies, disabling micro-components, incompatible finishes, and composite material choices embody design priorities that are often articulated without considering their downstream implications. The absence of stable feedback loops between designers, manufacturers, and recyclers further amplifies these disconnections, allowing misalignments to persist across the production system.

In such configurations, waste represents the material manifestation of unresolved tensions between aesthetic, functional, and symbolic ambitions on the one hand, and infrastructural, technological, and regenerative capacities on the other. It is precisely within these ecologies that the limits of current design practices become most evident, revealing how circular transition is hindered when design operates in isolation from its systemic consequences.

WHAT IS BEING RESHAPED, AND WHY IT MATTERS

The analysis of waste ecologies shows that the circular transition currently underway in Italian fashion manufacturing cannot be interpreted as a simple reconfiguration of material flows or as a technical adjustment to new regulatory requirements. What is being reshaped is a deeper

and more articulated set of relations that concerns the very boundaries of the production system, the value hierarchies that structure it, and the forms of responsibility that regulate its functioning. Waste Ecologies reveal how circularity in Italian fashion manufacturing is not a uniform process, but a differentiated and situated one, shaped by specific material, organizational, and territorial conditions. By following waste across these configurations, the analysis makes visible the concrete trajectories through which the manufacturing system is being reshaped, as well as the structural constraints that continue to limit systemic transition.

RESHAPING BOUNDARIES: FROM LINEAR SUPPLY CHAINS TO EXTENDED WASTE-BASED ECOLOGIES

First, waste ecologies make evident an ongoing redefinition of the boundaries of the Made in Italy fashion manufacturing system. Traditionally, Italian manufacturing has been conceptualized as a sequence of highly specialized production phases, centered on product quality and territorial proximity among actors. Focusing on waste unsettles this representation, revealing a more extended and porous system that includes collection and treatment infrastructures, logistics platforms, waste service providers, regeneration actors, and environmental governance devices previously considered external or ancillary.
In this sense, circular transition redefines who belongs to the system and which activities become strategic. Waste ecologies show that the manufacturing system does not end with production or sale, but continues across the territories where waste is sorted, accumulated, valorized, or blocked. For Made in Italy, this entails a significant shift: competitiveness no longer depends exclusively on the ability to produce quality, but on the capacity to govern an expanded system of material and infrastructural relations.

RESHAPING VALUE HIERARCHIES: FROM RESIDUE TO STRATEGIC MATERIAL

The analysis highlights a transformation of the value hierarchies that structure the fashion system. Within waste ecologies, waste assumes an ambivalent role: on the one hand, it signals inefficiencies, material incompatibilities, and infrastructural limits; on the other, it becomes a strategic resource around which skills, investments, and design practices are reorganized. This ambivalence challenges the historical association between value and the finished product, shifting attention toward processes, intermediate materials, and industrial residues.
This transformation is particularly significant in the Italian context, where production has historically been oriented toward material quality, while post-consumer flows increasingly reflect the logic of the global fast fashion market. Waste ecologies make this structural discontinuity visible: Italy produces high-quality, potentially regenerable pre-consumer waste, yet must contend with heterogeneous, contaminated, and difficult-to-treat post-consumer waste streams. In this scenario, waste becomes a site of negotiation between divergent value models, revealing a central tension for the future of Made in Italy.
Design plays a key role in redefining these hierarchies by translating material constraints into design criteria and making the systemic implications of choices related to composition, assembly, and finishing visible. Through this lens, value is no longer attributed exclusively to the object itself, but to its compatibility with broader productive and regenerative ecologies.

RESHAPING RESPONSIBILITIES: FROM INDIVIDUAL TO DISTRIBUTED GOVERNANCE

A third level of reconfiguration concerns responsibility relations along the supply chain. The introduction of EPR and the strengthening of the European regulatory framework formally shift attention toward the entire product life cycle. However, the analysis of waste ecologies shows that responsibility does not automatically redistribute evenly, but is negotiated within specific socio-material configurations marked by power asymmetries, differentiated operational capacities, and infrastructural constraints.
Following waste makes it possible to observe how responsibility is translated into everyday practices: who selects residues, who invests in traceability, who absorbs the costs of material inefficiency, and who benefits from valorization opportunities. In this process, new intermediary roles emerge—such as textile waste service providers and regeneration actors—that do not merely manage flows, but actively contribute to redefining the conditions of possibility for circularity.
For Made in Italy, this implies a reconfiguration of responsibility not only as a regulatory obligation, but as a distributed and territorially situated competence. Waste ecologies show that the capacity

to respond to the ecological transition depends on the ability to construct shared responsibilities, supported by adequate infrastructures and coherent design practices.

Taken together, these processes indicate that what is being reshaped is not simply the fashion supply chain, but the way Made in Italy conceives itself: no longer as a linear, product-oriented chain, but as a productive ecology grounded in relations, materials, and territories. Waste ecologies make visible that the circular transition cannot be addressed as an incremental adjustment, but as a systemic transformation that affects productive identities, organizational arrangements, and value regimes.

From this perspective, it is through the capacity to recognize, govern, and design its own waste ecologies that Italian fashion manufacturing can transform circularity into a strategic lever for resilience and competitiveness. The contribution of this article lies precisely in showing how waste ecologies enable a situated and materially informed reading of the reshaping processes currently underway, and in identifying the conditions under which such transformations can consolidate over time.

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RESHAPING FASHION TOWARDS INCLUSION AND SOCIAL RESPONSIBILITY

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Abstract

Sustainability in the fashion industry has predominantly been addressed through environmental and circular economy perspectives, often overlooking its social dimension. This paper argues that social sustainability must be recognised as a core component of sustainable fashion. Mainstream fashion continues to reproduce normative body standards and marginalise people with disabilities, while only a limited number of specialised enterprises challenge these paradigms. Adopting a mixed-method qualitative approach, this study investigates the relationship between fashion and inclusion across three interconnected levels: the scientific debate, public perception, and market practices. The research combines a scoping literature review, a digital ethnography, and a desk-based analysis of fashion case studies. By integrating these data sources, the paper critically examines prevailing models of disability, design approaches, product features, and representational strategies within the fashion system. The findings reveal a dominance of function-driven, medicalised design approaches that prioritise performance and discretion at the expense of aesthetic expression. In contrast, emerging inclusive fashion practices reframe clothing as expressive artefacts challenging conventional assumptions about the "standard" body and expanding aesthetic norms. The paper contributes to design research by articulating fashion as a socio-cultural system of artefacts, values, and representations, emphasising the need to move beyond adaptive solutions towards systemic inclusion.

Keywords: *Fashion, Disability, Body Diversity, Inclusion, Representation*

INTRODUCTION

In recent years, the issue of inclusion of marginalised social groups has increasingly emerged as a key concern taking on a central role in political, social, and scientific debates across different cultural and institutional contexts. The growing awareness of inequalities and social exclusion has highlighted how discrimination can hinder individual potential and undermine social cohesion, making these issues one of the most significant challenges facing contemporary societies. Discrimination not only constrains individual agency and life opportunities, but also weakens social cohesion and collective well-being, positioning inclusion as one of the most pressing challenges facing contemporary societies (Barton, 2006; Putnam, 2005). This challenge concerns all economic sectors, influencing the ways in which organizations operate, innovate, and represent social values. Within this framework, the fashion industry occupies a particularly influential position. Standing at the intersection of culture, creativity, and the market, fashion plays a key role in shaping social imaginaries, body norms, and systems of value (Annett-Hitchcock, 2023). Through design practices, visual representations, and material artefacts, fashion actively contributes to defining which bodies are considered desirable, normal, or legitimate. Numerous studies have shown how mainstream fashion has historically reinforced ableist and exclusionary standards by privileging normative body ideals and marginalising non-

conforming bodies, including those of people with disabilities (e.g., Hall & Orzada, 2013; Melkumova-Reynolds, 2023). At the same time, fashion also holds transformative potential: as a cultural and design-driven system, it can function as a powerful vehicle for inclusion, self-expression, and social recognition when alternative models and practices are adopted (Foster & Pettinicchio, 2022). The research discussed in this paper is part of the project "ResHaping made in ITAly" (RHITA) that aims to reshape the Italian fashion landscape towards sustainability in terms of digital transition, circular economy, and inclusion - also broadening the view outside the confines of the Italian context to investigate the relationship between fashion and inclusion. The research started from the assumption that sustainability in the fashion industry should extend beyond circular economy and environmental perspectives to encompass social sustainability as a responsibility of the fashion players to address inequality, challenge discriminatory norms, and design products, systems, and representations that acknowledge bodily diversity. While sustainability initiatives in fashion have predominantly focused on environmental impact and resource efficiency, recent scholarship argues for an expanded understanding of sustainability that explicitly incorporates its social dimension (Rana et al., 2024; Venkatesan, 2025). Emerging practices in inclusive and adaptive fashion illustrate this shift. Independent brands such as *EveryHuman*[1], *Buck & Buck*[2], and *Free Form*[3] have demonstrated how clothing design can integrate functional accessibility with aesthetic expression, while also embedding ethical commitments and community engagement into their business models. Conversely, the limited and often symbolic initiatives of major fashion brands highlight the risk of superficial inclusion, or "DEI (Diversity - Equity - Inclusion)-washing," where diversity is addressed without structural change. Understanding how the fashion domain simultaneously perpetuates exclusion and enables inclusion is therefore essential for guiding innovation towards collective well-being, ensuring that fashion's social, cultural, and economic value extends beyond a restricted segment of society. Standing the complexity of the issues at stake and with the aim to contribute to the debate, we performed the research adopting a mixed qualitative method that included: a) a scoping literature review to investigate the scientific debate; b) a digital ethnography to understand the public perception and social debate; c) a fashion market analysis through the collection of some case studies to understand the market landscape. The data corpus included several materials that were integrated to avoid a simplistic or polarised interpretation of the relationship between fashion and inclusion (Annett-Hitchcock, 2023). The final goal is to highlight potential trajectories for re-shaping the fashion landscape towards inclusion and social responsibility.

Framing social sustainability in the fashion studies

Sustainability in the fashion studies has gained increasing relevance in recent years (e.g., Daukantiene, 2023; Rita Sedita et al., 2025; Schiaroli et al., 2025). When mapping the evolutionary trajectories of the fashion studies, Rita Sedita and colleagues (2025) identified a progress from an initial focus on the environmental impact that led to eco-friendly products, sustainable supply chain management, sustainable design approaches (e.g., zero-waste design, design for durability), to a holistic perspective that considers also the social aspects of sustainability. These aspects are mainly considered in terms of fair working conditions (Schiaroli et al., 2025), consumers' awareness, and sustainable consumption practices such as lowsumerism, capsule wardrobe, and second-hand clothing (Daukantiene, 2023). Given the multidisciplinary nature of the fashion studies, the research agendas call for addressing sustainability along the entire value chain through next-generation material, collaborative fashion consumption systems, business models based on rental rather than purchase, data analytics methodologies, transparency and ethical sourcing, second life retailing, just to name a few directions (Abbate et al., 2023; Sinha et al., 2023; Schiaroli et al., 2025). These directions of the research agendas overlook that social sustainability is related to inclusion, social equity, and justice for all individuals, irrespective of their abilities, identities, and cultural background. This concept applied to the fashion domain calls for considering fashion brands as influential cultural entities which shape cultural norms and consumer behaviors (Lee et al., 2024 a, b). Acknowledging their role, the fashion enterprises are increasingly taking on social responsibility conceived as the relationship

1 EveryHuman. https://everyhuman.com.au/
2 Buck & Buck. https://www.buckandbuck.com/
3 FreeForm. https://freeformstyle.com/

between business and society based on trust, transparency, shared values, ethical behaviour, and societal impact (Thorisdottir & Johannsdottir, 2020; McBee-Black & Sun, 2024). The theme of social responsibility of the fashion enterprises is intertwined with relevant reflections on power dynamics leading to inclusion or exclusion, on the legitimacy of some narrations and canon normativity in the contemporary fashion discourse (Jansen, 2020; Pilyarchuk, 2024), on the socially constructed meaning of clothing (Kaiser et al., 1985; Nagasawa et al., 1991; Kaiser, 1997; Kaiser, 2001), as well as on the role of editorials and advertising campaigns in conveying representations where diversity in body, gender, ethnicity, ability can be portrayed or remain invisible (Foster & Pettinicchio, 2022; Berger & Hermes, 2023; Oliveros, 2024; Pilyarchuk, 2024; Venkatesan, 2025).

OBJECTIVES AND METHODOLOGY

The research was carried out through a mixed method to investigate the relationship between fashion and inclusion from different perspectives: the scientific debate, the public perceptions, and the fashion market. The Research Questions (RQs) that guided the data collection and analysis are the following.

- RQ1: How does the fashion domain contribute to reinforcing and spreading stereotypes and exclusion of people with disabilities?
- RQ2: How can the fashion domain convey the values of inclusion, respect, and valorisation of diversity?
- RQ3: What are the models and values that guide the design of fashion products for people with disabilities?

The variety of methods used to respond to these RQs allowed us to produce a comprehensive data corpus.

SCOPING LITERATURE REVIEW

The scoping literature review aims at analysing the scientific debate about the role of fashion in reinforcing stereotypes and stigma, or in promoting an inclusive approach. It is an exploratory investigation of the scientific literature to develop an overview on the landscape and key concepts of a broad topic like the relationship between fashion and inclusion (Peterson et al., 2017). The scoping literature review was performed through the following steps:

1) definition of the scope, databases, keywords, exclusion criteria;
2) records identification through database searching and other sources (in-text citations);
3) removal of duplicate records;
4) screening of the records based on metadata and abstract reading;
5) screening of the records based on full-text reading;
6) analysis of the selected records.

The database searching was performed on November 2025 on Scopus and Google Scholar using the following keywords: fashion, disab* OR impairment, accessor*, inclus*, "inclusive fashion". The database searching provided 215 records and additional 43 records were retrieved from in-text citations. For the Google Scholar database, we limited the record identification to the first 154 search results. Given the exploratory and broad nature of the scoping literature review (Peterson et al., 2017), the exclusion criteria used for the screening were defined as follows.

a) the record is not written in English language;
b) the full text of the record is not accessible for the authors;
c) the record is out of topic considering the research objectives;
d) the record does not contain enough detail to answer the RQs.

After the screening process, 75 records were selected as eligible for the data analysis [fig. 01]. The data analysis was performed as a content analysis by clustering the contents of the selected records according to the RQs. A digital online board was used to facilitate the process.

SELECTION OF CASE STUDIES FROM THE FASHION MARKET

To understand how the fashion market addresses the challenges of inclusion and social responsibility, we performed the desk research to identify relevant examples of fashion enterprises, using Google search with the keywords "adaptive clothing" and "inclusive fashion", and based on the data collected

through the digital ethnography. We selected 21 case studies [fig. 02][4]. Most of them (14 out of 21 case studies) are located in the United States of America. The fashion enterprises specialised in adaptive clothing and inclusive fashion are small enterprises (17 out of 21 case studies), while the major fashion brands with a catalogue section of adaptive clothing are big enterprises with some branches worldwide. Considering the size and variety of the catalogues, some enterprises have a large and varied offering featuring a wide range of products, styles, and sizes to meet different customer needs, while other enterprises focus on a more limited and highly specialized selection, concentrating on specific products or style (e.g., backpacks for wheelchair as in the case of the adaptive catalogue of *JanSport*[5]*).* For each selected case study, we examined the web site and catalogue of products, and we reported the main information on a summary sheet [fig. 03]. The summary sheets were useful to map and to compare the brand identity, the product features, the consumers' need, and the images used to present the products. Notably, this research does not claim to provide a complete and comprehensive mapping of the market complexity. Rather, it generates some insights to understand the state of the art and to identify future trajectories towards consumers' inclusion and enterprises' social responsibility.

DIGITAL ETHNOGRAPHY

The digital ethnography was performed on two social media, *Reddit* (https://www.reddit.com/) and *Pinterest* (https://it.pinterest.com/), to investigate the social debate and public perspective on the fashion market especially by the people with disabilities. We selected these two social media because of their characteristics, as detailed hereafter. The data corpus includes a selection of online discussions and images. The analysis of the data was performed through a bottom-up approach to identify thematic patterns and to categorise the data based on the patterns. *Reddit*

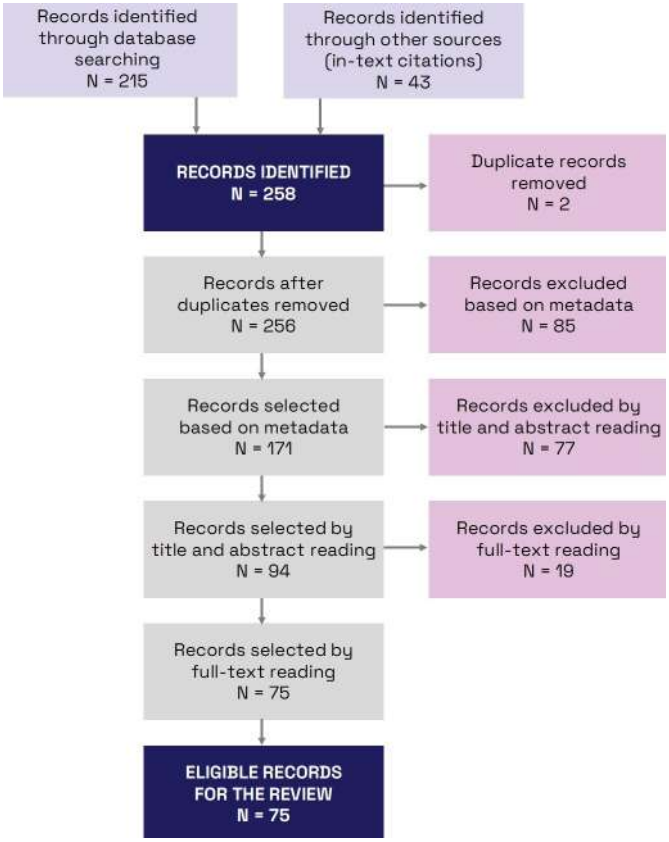

Fig. 01

is structured in subreddits, thematic communities centered around particular interests, practices or specific identities, allowing analysis about norms, shared values or language. Our analysis considered three communities: *r/amputee* (around 11.000 members); *r/disability* (around 69.000 members); *r/wheelchairs* (around 13.000 members). Data were collected from October 2024 and January 2025. The contents in all three subreddits are written discussion-oriented posts, where the main themes are mutual help, social and emotional support for new members. Fashion and aesthetics were rarely discussed in *r/amputee and r/disability,* where people focused mainly on the functional aspects of clothing and accessories, and only few posts mentioned visibility and "normalization" of prostheses and personal difficulty in finding fitting garments for personal styling. In r/wheelchair, fashion-centred discussions, even though it wasn't the main topic, were periodically shared compared to the other two subreddits. Here wheelchairs users talk about clothing and wheelchairs customizations. Wheelchairs are not considered just a medical device, but a styling tool that reflects one's own personal aesthetic preference. The lack of contents

4 Abilitee. https://abilitee.com/pages/about-us. Adidas. https://www.adidas.it. Ankhgear. https://ankhgear.com/. Billy Footwear. https://billyfootwear.com/. CathWear. https://cathwear.com/. Delta adaptive clothing. https://easyaccessclothing.com/. Eze Mode Plus. https://www.ezeplus.com/?lang=en. Feeldom. https://www.feeldom-life.com/. Friendly shoes. https://friendlyshoes.com/. IZ adaptive. https://izadaptive.com/. Kozie clothes. https://www.kozieclothes.com/. No Limbits. https://no-limbits.com/. Slick Chicks. https://slickchicksonline.com/. Tommy Hilfiger. https://tommy.com. Victoria Secret. https://victoriassecret.com

5 JanSport. https://www.jansport.com

strictly related to fashion and aesthetic suggests a scarce awareness of these issues entering with a predominance of common-sense debates on social acceptance, political issues, and practical advice. At the same time, the data analysis revealed a growing awareness about the disability representation in fashion communication and the growing role of inclusive fashion brands. *Pinterest,* as a visual-centred platform, allowed us to analyse common aesthetic and symbolic representations around specific themes, using textual prompts. The majority of images linked to "disabilities fashion" or "inclusive fashion" focused on physical disabilities, showing wheelchairs and prostheses. This is more likely due to the visual immediacy of certain images reflecting common expectations about disabilities.
Results

The data analysis allowed us to compose a framework of topics and points of view, ranging from needs and preferences of the consumers to the terminology used to address them, to the declared

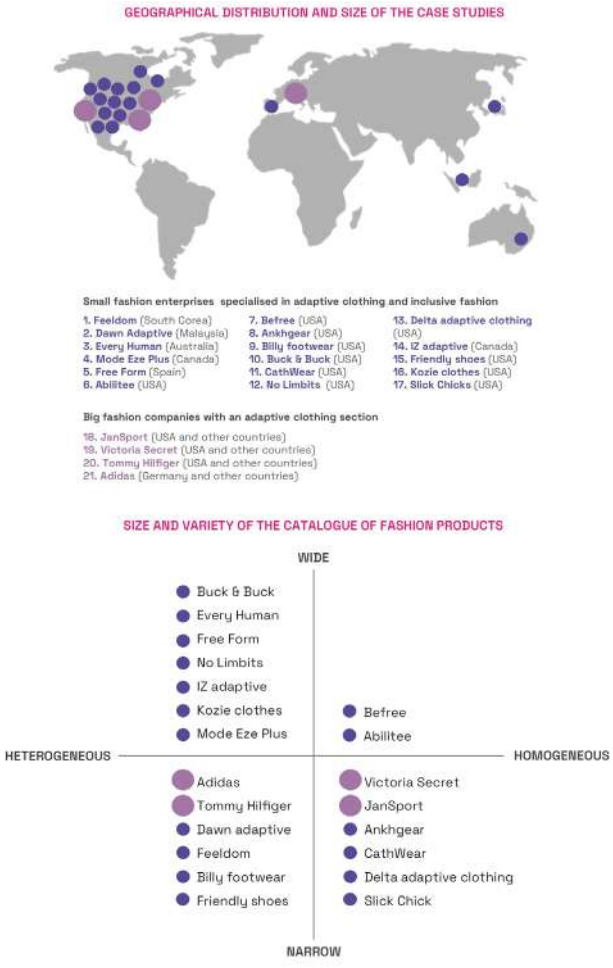

Fig. 02

mission of fashion enterprises [fig. 4].

FROM ADAPTIVE CLOTHING TO INCLUSIVE FASHION AND FASHION FOR EVERY BODY

The scientific literature provides evidence about the challenges faced by people with disabilities to find clothing that meets their needs for style and comfort (Curteza et al., 2014; Annett-Hitchcock & Xu, 2015; Lobo et al., 2019). This happens because the mainstream fashion industry tends to neglect this market segment based on the misconception that it is small and thus not profitable (Chang et al., 2013; Lobo et al., 2019; Rana et al., 2024). From a design perspective, this attitude is not merely the result of limited market availability, but is rooted in dominant design paradigms that presuppose an able-bodied, upright, and normatively proportioned user. Mainstream fashion design processes are largely oriented toward standardised bodies and idealised silhouettes, with garment construction, sizing systems, and material choices optimised for standing postures, symmetrical movements, and autonomous dressing practices. As a consequence, clothing often fails to accommodate diverse bodily configurations, assistive devices, or alternative modes of interaction with garments.The marginalisation of disabled consumers is further reinforced by persistent misconceptions within the fashion industry. Some studies highlighted how this user group is frequently perceived as economically insignificant, aesthetically indifferent, or excessively demanding in terms of production complexity (e.g., Chang et al., 2013; Rana et al., 2024). These assumptions translate into design decisions that prioritise efficiency, scalability, and visual conformity over inclusivity, leading to the exclusion of disability-related needs from early design stages. When disability is addressed, it is often framed as a technical problem requiring corrective or adaptive solutions, rather than as a generative design opportunity capable of expanding aesthetic languages and fashion practices (Lobo et al., 2019). Moreover, the prevailing separation between functionality and aesthetics in fashion design contributes to a reductive understanding of clothing for people with disabilities. Garments designed under a predominantly medical or rehabilitative framework tend to emphasise ease of dressing, access points, and material performance, while neglecting the symbolic, expressive, and identity-related dimensions of dress (Annett-Hitchcock & Xu, 2015). This functionalist bias

reinforces the notion that style and self-expression are secondary concerns for disabled individuals, thereby perpetuating exclusion at both material and cultural levels. From a design standpoint, challenging these assumptions requires a shift toward inclusive and participatory design approaches that recognise disability as an integral dimension of human diversity and position fashion as a socio-cultural system capable of fostering agency, dignity, and belonging. The market analysis performed on the selected case studies revealed a main distinction between a growing number of small enterprises specialised in adaptive clothing and inclusive fashion, and a few major fashion brands that improved their catalogues with some adaptive clothing. Only two major fashion brands explicitly motivated the improvement in the catalogue based on their commitment towards social responsibility. While the web sites of the enterprises specialised in adaptive clothing and inclusive fashion clearly report that their missions cover ethical and sustainable production, economic support to people and communities, and advocacy to the local/international movements promoting inclusion. Such a kind of fashion enterprises go beyond the simple production and sale of goods by actively engaging in initiatives with a positive social impact. Through ethical commitments and social responsibility, they seek to contribute to a broader societal change while redefining the role of fashion as a driver not only of economic value, but also of social progress.

In the data corpus collected with the diverse research methods, the most recurrent target group includes the people with motor disabilities using wheelchairs. In this case, the design of the fashion products is focused on clothing that is easy to wear while sitting. But the market analysis pointed out that the fashion products are designed not just for people with a permanent or temporary disability, but also for diverse body shapes, ages, and everyday life situations. This heterogeneity of the target consumers is visually represented in the fashion catalogues with images of people of diverse gender, age, ethnicity, and body shape wearing different kinds of clothes.The terminology used to address this heterogeneity should be carefully chosen since language reflects underlying assumptions and specific conceptualisations, shaping how social issues are understood, communicated, and addressed. The term "adaptive clothing" presupposes the implicit norm of the

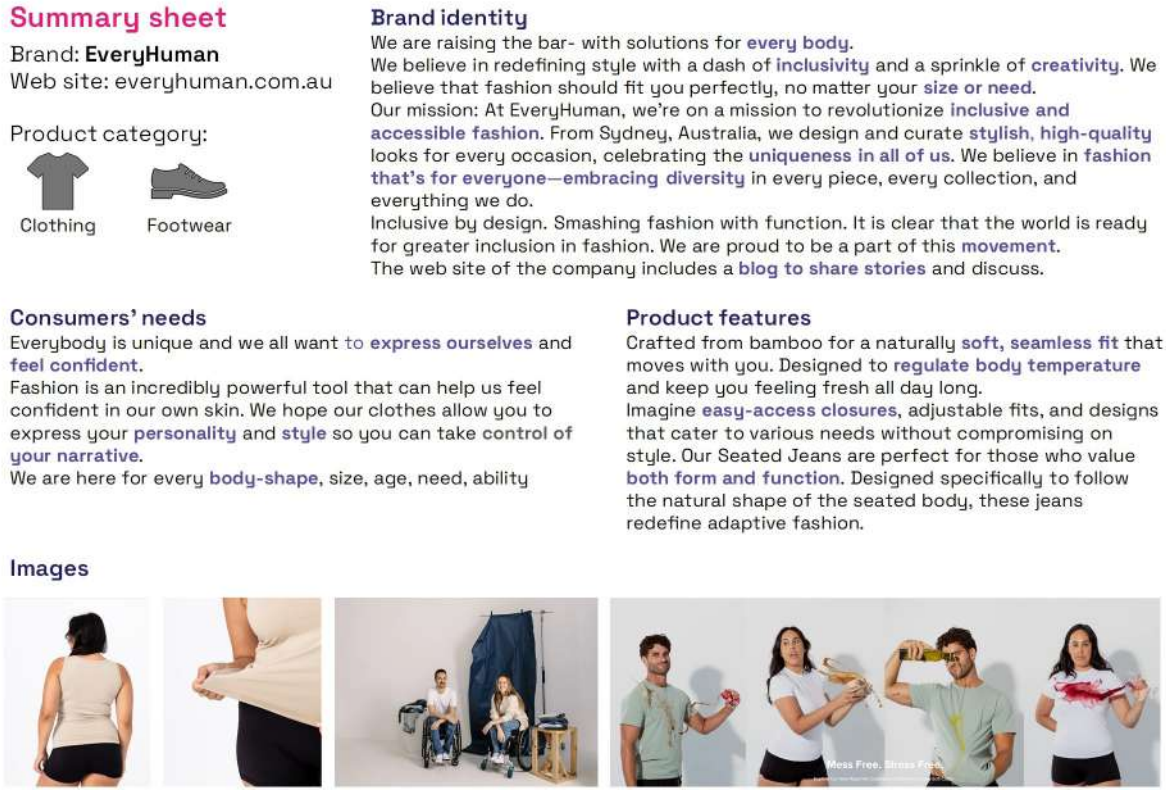

Fig. 03

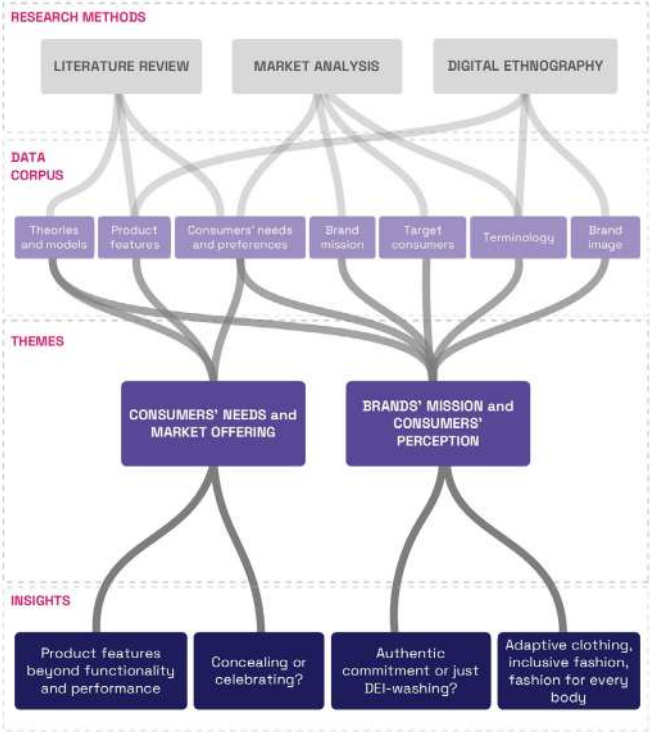

Fig. 04

standard body, a deviation from it and a corrective intervention, so that the clothing adapts to an exceptional case that is not dominant. Notably, this term is the only term used by the major fashion brands to present products targeted to people with disabilities. On the contrary, the term "inclusive fashion" acknowledges the plurality of bodies, needs, preferences, identities, and thus the diversity is at the foundation of the design. Differently, the term "fashion for everyone" recalls a universalism that could lead to an abstract (and ideally neutral) conception of the human being. Finally, the term "fashion for every body" marks the pluralities of the human bodies, extending the dominant norm to various body sizes, shapes, ages, abilities, sex, and genders. Moreover, compared to the term "adaptive clothing" that focuses on the product, the other terms (inclusive fashion, fashion for everyone, fashion for every body) shift the focus from the product to the system. Quoting the web site of the company *Dawn Adaptive*[6], "a more inclusive fashion industry [is the] one that integrates accessibility not only in design but throughout marketing, customer service, and the entire retail experience, ensuring everyone can participate fully in fashion".

PRODUCT FEATURES BEYOND FUNCTIONALITY AND PERFORMANCE

Considering the product features, adaptive clothing ensures high quality of design and material, functional, comfortable, customisable products, easy to wear and fit with the movement. Just to name a few examples: the pants designed by *Free Form* are made of hypoallergenic natural fabrics, with zippers on the side of the hip and legs for opening, with double-sliders so they can be opened from the top and bottom; the zipper pants designed by *Befree*[7], unlike traditional pants, can be easily put on and taken off while standing, lying down, or from a sitting position, and they can accommodate casts, braces and other medical equipment for post-surgery and injury recovery. The scientific literature provides clear requirements to guide the design of the adaptive clothing with special properties and performances (e.g., Curteza et al., 2014). Considering how the selected fashion enterprises present their products, we identified a main pattern: the major brands with the adaptive clothing collection focused on the functional features of the product (e.g., fit optimisation, minimal seams, soft yarns, one-handed zippers, magnetic buttons); while the enterprises specialised in inclusive fashion tend to highlight not only the functional features of the products according to specific consumers' needs, but especially the experience that the products can offer. The way people perceive themselves when wearing fashion products appears to be their main market differentiation: while standard clothing makes people feel unsafe, unattractive, humiliated, vulnerable, uncomfortable, and restricted - the adaptive clothing makes them feel safe, fashionable, self-confident, free to express themselves, comfortable, and independent. This is in line with the evidence provided by the scientific literature investigating the impact of clothing on the experience of people living with disability (e.g., Annett-Hitchcock & Xu, 2015; Kabel et al., 2017)This acknowledges the power of clothing in promoting self-confidence and self-expression, and in counteracting the stigmatisation (Lobo et al., 2019). Otherwise, as reported by the scientific literature, the lack of attractive clothing is detrimental to the overall well-being since the person cannot present themselves according to their personal sense of style and identity, and they are concerned about what other

6 Dawn Adaptive. https://dawnadaptive.com/

7 BeFree. https://befreeco.com/

people think of them (Annett-Hitchcock & Xu, 2015; Chang et al., 2017). This is critical especially in the case of important life occasions, celebrations, and formal events: the lack of appropriately designed clothing is a barrier for participation. This harms relationships, reinforces isolation and exclusion (Kabel et al., 2017). The enterprises selected as case studies to understand the market landscape offer only casual shoes, bags, underwear and sport/fitness-related clothing. Elegant and formal clothing are hard to find on the market, let alone clothes that are not based on Western fashion models. This is an unmet need that negatively impacts social engagement (Li et al., 2023).

Through the digital ethnography, we collected a thread of discussion among *Reddit* users who state that they are forced to use casual comfortable clothes given the lack of alternatives available on the market. A quote from a user with motor disability who uses the wheelchair points out that: "Jeans and a sweatshirt have become my uniform, purely for comfort. I'd like to dress well. I'd really like to expand my wardrobe with more interesting fashion expressions (especially with winter coming - there are so many really cool styles for men out there)'. Another user replied stating: "Finding reasonably priced, attractive, and fashionable clothing that is comfortable for wheelchair users is difficult".

Facing the failure of the fashion market to meet people's needs, personalization practices have become established among people with disabilities, as both the scientific literature and the digital ethnography pointed out. The personalisation of garments and accessories is often referred to as "fashion hacking" performed by online communities on social media to share ideas and solutions. In a manner not dissimilar to the Information Technology field, the term has both a technical and a political meaning: the practice of hacking one's own clothing enables individuals to accommodate diverse body configurations and personal styling requirements; at the same time, it constitutes a form of critical design practice that challenges dominant aesthetic norms and standardised modes of industrial production (Barry, 2019; Barry et al., 2023). Through acts of modification, adaptation, and reappropriation, fashion hacking operates not only as a pragmatic response to unmet needs, but also as a situated form of resistance that questions ableist design assumptions and reclaims creative agency within the fashion system. Customization, DIY (Do-It-Yourself) practices contribute to defining people with disability as designers of their own garments, increasing their sense of personal agency in the making of personalized clothing and accessories (Profita et al., 2018).

CONCEALING OR CELEBRATING?

Both the scientific literature and the digital ethnography pointed out a dichotomy in the function of the clothing between concealing (hiding physical differences and visible impairments) or celebrating (enhancing self-expression, communicating group identification) (Lobo et al., 2019). Adopting the theoretical lens of the negotiated outcomes model - theorized by Susan B. Kaiser (Kaiser et al., 1985; Nagasawa et al., 1991; Kaiser, 1997; Kaiser, 2001) to understand how people negotiate the meaning of their appearance in social interactions, using dress and adornment to present aspects of themselves to others and receive positive social feedback, especially in the case of stigma or physical differences - we assume that clothing acts as a means to control other people's perception and reaction. Bodily differences, prosthesis, and assistive devices act as visual cues and signifiers for stigmatizing categorization, based on specific definition of normalcy within the social dominant model (Hall & Orzada, 2013; Melkumova-Reynolds, 2023). Normative design practices, by reproducing assumptions about body image and functions, reinforce expectations in which disabled corporalities have no room (Hamraie & Fritsch, 2019). This leads people to hide their non-normative bodies to conform to normative standards, to look like everyone else, to avoid negative reactions by other people like aversion, repulsion, pity (Hall & Orzada, 2013; Melkumova-Reynolds, 2023). Adaptive clothing and assistive devices, while designed primarily with their function in mind, are conceptualized to be aesthetically discreet, hidden and disguised (Brilhante et al, 2021). This approach of camouflaging the disabilities could foster an aesthetic hierarchy that contributes to reinforcing the stigma and exclusion (Wilkinson et al., 2018), suggesting that non-conforming bodies are something to hide and be ashamed of (Barry, 2019). With the same intention to control social reaction but in the opposite direction, appearance management through clothing is used to emphasize uniqueness and visible differences,

even as a form of social and political statement (Kaiser, 1997; Hall & Orzada, 2013). What has long been defined solely as a medical device is now also considered a stylish accessory, as data from the digital ethnography suggests. Grassroots practices such as customization and fashion hacking manage to reclaim visibility, no longer conceptualised as a problem to solve, but as a social and political resource (Hamraie & Fritsch, 2019) used to oppose hegemonic aesthetic and affirming non-normative bodies. Prostheses have traditionally sought to achieve a realistic form factor to closely replicate the limb they replace. By contrast, this alternative approach emphasizes creating personalised prostheses, whether through unconventional shapes (Whatley et al., 2023; Burton & Melkumova-Reynolds, 2019) or through playful design strategies that better reflect children's expectations of what their prostheses can be (Sansoni et al., 2016). In a similar manner, cochlear implants users customize their devices using vibrant colours, exaggerating shapes and using pop references to make them more personal, in opposition to the norm that want hearing aid devices to be "invisible" and discreet, drawing attention to them and, by doing so, to their disability in order to reclaim the power of managing other people expectation, and fostering relationships with other assistive technologies users (Profita et al., 2018). A notable example of paradigm shift in the design of hearing aids are the smart jewels designed to address emotional and sociocultural needs of deaf people beyond the functional goal of supporting hearing (Marti & Recupero, 2019; Marti, 2021).

AUTHENTIC COMMITMENT OR JUST "DEI-WASHING"?

The digital ethnography revealed that the social debate is focused on the intentions of the fashion enterprises behind their offering of fashion products. A quote from a *Reddit* user exemplifies the reaction to the hands-free slip-on shoes of a major fashion brand: "They finally make a shoe for us and you're pissed?". The concerns of some users are related to the expensive cost of this product, and to the effort of the brand that is perceived as not authentic, but rather occasional, to present itself positively to the public. Similarly to the greenwashing phenomenon related to the environmental sustainability initiatives, DEI-washing (Diverse - Inclusive - Equitable) happens when organisations make superficial or symbolic efforts to appear inclusive without enacting meaningful, structural change (van Rijswijk et al., 2025).

This issue recall what is discussed in the *paragraph 3.1* regarding how the fashion enterprises present themselves and their products: companies specialised in inclusive fashion conceive a strong connection between economic profit, social responsibility, and social impact and they pursue this mission through the design of clothing for diverse consumers as well as through sharing stories from the community, supporting social initiatives and local/global movements. This approach is in line with the social model of disability that argues that people are disabled because of the societal barriers (physical, attitudinal, organisational, and structural barriers), shifting the focus from fixing the individual condition - the medical model of disability - to changing society towards equal opportunities (Barton, 2006). Moreover, this approach acknowledges the function of clothing beyond practical aspects and contextualises the experience of the people with disability within the socio-cultural context (Venkatesan, 2025). We believe that the authentic commitment of the fashion enterprises towards social responsibility should be based on such an approach.

DISCUSSION

Returning to the Research Questions that guided this study, this section discusses the main findings with the aim of identifying potential trajectories for reshaping the fashion domain towards greater inclusion and social responsibility.

RQ1: How does the fashion domain contribute to reinforcing and spreading stereotypes and exclusion of people with disabilities?

The current fashion market makes it difficult to find (at an affordable price) products that fit with one's needs, identity, and diverse life situations (Kabel et al., 2017; Rana et al., 2024). There is a significant gap between the demand of the consumers with temporary or permanent disability, and the range of products currently supplied by the market (Chang et al., 2013; Lobo et al., 2019). When the market fails to respond to consumers' demand, the online communities grow to promote and support the fashion hacking practices: fashion hacking is not limited to adjusting clothing to accommodate one's body configuration (e.g., for easily donning on and off trousers from a sitting position), but

rather it includes customisation practices based on personal styling preferences, cultural norms, and social occasions, to use clothing as a means for appearance management (Kaiser, 1997). The fashion domain seems to perpetuate the canons of bodily normalcy and disregards the differences in consumers' needs and preferences (Brilhante et al., 2021; Melkumova-Reynolds, 2023), especially in the way the fashion products are presented in advertisements and editorial venues (Foster & Pettinicchio, 2022; Qayyum et al., 2023). Indeed, the fashion domain contributes to exclusion through norms that assume able-bodied users, invisibilising disabled bodies and needs (Brogin & Okimoto, 2019; Annett-Hitchcock & Xu, 2015). This approach derives from, and at the same time reinforces, the medical model of disability that tends to restore normal functioning by correcting the individual impairment, illness or injury that is socially undesirable, and thus it is minimised in public appearance (Putnam, 2005). This approach has direct implications for the design of the fashion products, leading to the adaptive clothing with a focus on the functional features of the product.

RQ2: How can the fashion domain convey the values of inclusion, respect, and valorisation of diversity?

The fashion domain can propose new visual representations, narratives, and products which consider the clothing not just from a functional perspective (Foster & Pettinicchio, 2022; Melkumova-Reynolds, 2023; Qayyum et al., 2023), by designing products to be an extension of the self within the socio-cultural context (Hall & Orzada, 2013). This is relevant not only for fashion products but also for assistive and medical devices, which can be transformed into fashion accessories to counteract the stigmatisation (Profita et al., 2018; Marti, 2021). On one hand, the fashion domain can smooth out the diversity by designing "fashion (products) for every one", fitting diverse needs with a single solution. On the other hand, the fashion domain can valorise the diversity of bodies, social identities, cultures, genders, ages by normalising the diversity without diminishing one's unique characteristics (Lee et al., 2024a). The rise of fashion brand activism (Lee et al., 2024a) and the commitment of some fashion enterprises towards social justice are pushing a change in the fashion domain. But if this commitment is not authentic, merely for the sake of appearing inclusive, it is counterproductive: the social debate and the scientific debate about DEI-washing are questioning some initiatives of major brands as manipulative and unethical, perpetuating stereotypes and hindering a meaningful structural change of the fashion as a system (Foster & Pettinicchio, 2022; Lee et al., 2024a).

RQ3: What are the models and values that guide the design of fashion products for people with disabilities?

To reshape the fashion industry towards inclusion and social responsibility, it is necessary to go beyond the medical model of disability and a purely functional approach, to consider the impact of the clothing on psychological, social, and cultural levels. It is necessary to go beyond the standardisation of the human body and to question the conventional boundaries of beauty in favour of multiple models. Reducing clothing to a "technical solution" reinforces stigma (Kaiser, 1997; Barry, 2019; Annett-Hitchcock, 2023). Garments become a symbolic device capable of constructing identity (Hall & Orzada, 2013; Sansoni et al., 2016). For these reasons it is essential to include expressive and emotional objectives alongside functional ones in the project briefs when designing for disabilities, moving beyond the purely functionalist paradigm. There is no singular form of disability, rather it encompasses diverse and heterogeneous experiences (Putnam, 2005; Jansen, 2020; Pilyarchuk, 2024). Hence the need to involve people with disabilities in design processes (Brogin & Okimoto, 2019; Barry et al., 2023; Rana et al., 2024), refusing one-size-fits-all solutions. The centrality of situated bodily experience has been emphasised in design research (Curteza et al., 2014; Kabel et al., 2017; Brilhante et al., 2021). Rather than assuming a standardized body, designing for bodily diversity requires attention to the variability of bodies and gestures as they are enacted in everyday contexts, analysing of ordinary micro-actions (getting dressed, sitting, using the bathroom, and moving through space) through methods as body mapping and bodily user journey maps. Personalization, by redistributing representational and material agency, has been theorised as an emancipatory design practice, allowing people to actively shape how their bodies and identities are articulated and mediated (Barry, 2019; Profita et al., 2018; Whatley et al., 2023). It operates as a political intervention into normative design logic. Brands and campaigns that demonstrate the greatest impact do not simply

replicate mainstream fashion norms, but they actively reconfigure and expand them.

CONCLUSIONS

The exploratory mixed-method qualitative research presented in this paper enabled an examination of the relationship between fashion and inclusion from three complementary perspectives: the scientific debate, the social discourse, and the fashion market. By integrating the data across these domains, the research identifies key issues related to prevailing (mis)conceptions of disability, as well as to the ways in which fashion products are designed, represented, and perceived by communities of people with disabilities. People with temporary or permanent disabilities are an underrepresented consumer group who face challenges in finding products that meet their needs and preferences. Even when the fashion market provides adaptive clothing, the design based on the medical model of disability results in products with purely functional features to improve the comfort. This way overlooks the psychological, social, and cultural aspects involved in the human experience. The aesthetic appeal of adaptive clothing has been, and in part still is, ignored in favour of comfort so that consumers face challenges when searching for non-casual, non-Western products. When body image is understood as the collective set of representations and affective responses through which individuals perceive and evaluate their own bodies, it becomes evident that clothing functions as a key medium for self-expression and the construction of social identity (Kaiser, 1997). As human-made artefacts, fashion products are therefore not neutral objects but material carriers of cultural meanings and social values that shape how bodies are interpreted, recognised, and positioned within society. The design of the fashion products should consider three levels (Li et al., 2023): a) the functionality that is related to the utility in terms of protection, fit, and ease of movement; b) the communicative and symbolic aspects of clothing within a specific social-historical context; c) the aesthetics based on customers' desire for beauty within the context of one's cultural standards. Considering the multiple insights emerged from the research, they all address the dichotomy inclusion-exclusion, the relationship between social norms and fashion industry norms, and they highlights that the "inclusive revolution" (Pilyarchuk, 2024) can follow diverse directions: the representation of diversity in editorials and advertisement (Lee et al., 2024a-b; van Rijswijk et al., 2025), avoiding the creation of a sort of hierarchy of importance in which visible motor disabilities are prioritised over others (Foster & Pettinicchio, 2022); brand advocacy for diversity, that is not episodic, but extended beyond visibility to involve people in creative and decision making processes. Looking ahead, both the scientific literature and the social debate provide clear evidence, insights, and solutions for addressing the challenge of inclusive fashion, to guide the innovation of the fashion industry toward more responsible and socially aware practices. In light of this, we agree with Mazzarella and colleagues (2019) who state that to create counter-narratives to the current unsustainable fashion system, the designers need to become "activists" to disrupt dominant norms, reframe the problems, and make change happen at diverse scales of the fashion system.

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CAPTIONS

[Fig. 01] Stepwise process and number of included and excluded records for each step. Figure created by Annamaria Recupero; project ResHaping made in ITAly (RHITA); © 2026 The Authors.

[Fig. 02] Overview of the 21 fashion enterprises selected as case studies for the market analysis: (top) geographical distribution and size of the case studies; (bottom) size and variety of the catalogue of fashion products. Figure created by Annamaria Recupero; project ResHaping made in ITAly (RHITA); © 2026 The Authors.

[Fig. 03] Example of summary sheet used to collect and map the case studies. Figure created by Annamaria Recupero; project ResHaping made in ITAly (RHITA); © 2026 The Authors.

[Fig. 04] Overview of the data collected with the mixed-method qualitative research, the themes and insights generated. Figure created by Annamaria Recupero; project ResHaping made in ITAly (RHITA); © 2026 The Authors.

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GROUNDING PRACTICES

SUPPLY CHAINS, MANUFACTURING, AND CIRCULAR FASHION APPLICATIONS

CREATIVITY AND RESPONSIBILITY IN THE ITALIAN FASHION SYSTEM:

INSIGHTS FROM THE LEATHER GOODS AND TANNING SUPPLY CHAIN

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Abstract

The international competitiveness of the Italian fashion system today no longer depends on cost containment, but on its ability to integrate production specialization, sustainable innovation, and shared cultural values. The analysis of the leather goods supply chain, a strategic sector for Made in Italy and fundamental to the economies of the regions involved in the RHITA project. The persistence of tannery districts in Veneto, Tuscany, and Campania remains distinctive: cooperation among firms, concentrated expertise, and artisanal knowledge support advanced and traceable industrial processes. Within these local systems, new global pressures are increasingly intertwined. The entry of international groups, growing demands for transparency on environmental impacts, and the need to optimize resources are leading companies towards more circular models. In this context, stylistic choices influence the measurability of impacts and the durability of products. This transformation concerns not only production but also the forms that creativity takes. Innovation no longer resides exclusively in the designer's act but emerges from the daily interaction among diverse roles within the supply chain. Rethinking the Italian fashion system therefore means recognizing the relational value of this network of competencies. It is precisely from this industrial scenario that the educational context can draw decisive insights. The university becomes a place where tensions can be recomposed, sectoral contradictions interpreted, and an ethical awareness of design cultivated. Bringing students and companies closer together thus creates the conditions to imagine a future in which creativity and sustainability converge in the process of reshaping the Italian fashion system.

Keywords: *Fashion, Leather-goods, Tannery, University, Made in Italy*

LEATHER GOODS AS AN INTERPRETIVE AGENT OF MADE IN ITALY

Made in Italy is a synthetic and relational concept, emerging from the interaction between the intangible dimensions of design and the material qualities of products and their modes of production. It operates as a *meta-brand* (Barile, 2007), whose meaning is neither fixed nor univocal. Originally functioning as a label of origin, it has progressively accumulated multiple meanings in order to adapt to the changing needs of the global fashion system—a system structurally driven by constant transformation[1]. Over time, the imagery associated with Italian fashion has shifted from that of the family to that of the clan and, more recently, to that of the community. Yet it has consistently retained a collective and polyphonic character, as highlighted by numerous Italian scholars, including those involved in the research and publications developed within the Fashion Programme of the Università Iuav di Venezia (Brunello & Fava, 2024;

1 As Leopoldina Fortunati notes: "fashion is an emblem of postmodernity, also because, together with information, it manages contemporaneity by giving rhythm to social life and by marking—even at a superficial level—the passing of time through the continuous introduction of change. In this sense, fashion and information give individuals the illusion of keeping pace with the movement of the world" (Fortunati & Danese, 2005, p. 20).

Fava & Brunello, 2020; Frisa, Monti, & Tonchi, 2018; Frisa, Tonchi, & Mattirolo, 2014).
Within this framework, the leather goods sector is investigated here as an interpretive agent of the fashion system. Its supply chain encompasses a wide range of productive activities, from the transformation of raw materials, such as leather and metals, to the manufacturing of bags and accessories. This makes leather goods a particularly effective lens through which to examine the concrete existence of Made in Italy, understood both as a production system, still active in many industrial districts across the Italian peninsula, and as a cultural and commercial construct that continues to be communicated by brands and recognized by consumers. The communicative power of accessories labeled *Made in Italy* plays a crucial role in the turnover of luxury brands. In some cases, handbags account for up to 91% of total revenues (Chitrakorn, 2018), and they represent the best-selling category on online vintage fashion platforms (Shulman, 2017). These dynamics directly affect the Italian productive landscape. The leather goods manufacturing industry in Italy is a widespread and highly articulated sector organized in districts, employing approximately 760,000 people across more than 30,000 firms[2].

In recent years, the notion of Made in Italy has also become a central object of debate within design studies, fashion theory, and economic geography. Scholars have increasingly pointed out that national labels of origin cannot be understood simply as markers of place but must be analysed as complex socio-technical assemblages composed of people, skills, infrastructures, institutions, and narratives. From this perspective, Made in Italy functions less as a static guarantee of quality and more as a dynamic device that organizes expectations, coordinates production, and shapes consumer imaginaries. The leather goods sector, with its dense interweaving of material processes, symbolic value, and territorial embeddedness, offers a particularly fertile terrain for investigating how such a device operates in practice. By focusing on this segment of the fashion system, this paper seeks to move beyond abstract definitions of national branding and instead examine how Made in Italy is continuously enacted, negotiated, and transformed through everyday production activities.

Although often treated as a secondary field within fashion studies, leather goods are anything but marginal in the construction of the idea of the Italian product. The analysis of this supply chain therefore provides a valuable opportunity to observe both structural transformations and enduring features of the fashion system and of the values it conveys.

The continued presence of a segmented, highly specialized, and flexible supply chain is a key factor in the attractiveness of Italian production. These characteristics closely align with brands' seasonal cycles of product renewal, in which the integration of artisanal skills and industrialized processes is frequently required. New stylistic demands constantly challenge established modes of production, prompting both the development and optimization of industrial machinery and the reinterpretation of artisanal techniques. Yet, in brand communication, technological innovation and the creative intelligence embedded in production processes are often downplayed, while emphasis is placed on a generalized notion of craftsmanship that does not necessarily reflect the high levels of technology and invention actually involved. The capacity to combine industrialization and craftsmanship is a defining feature of Italian manufacturing. Today, Italy's competitive advantage no longer lies in low-cost labor but in a segmented, differentiated, and highly specialized organization of production. An analysis of the territorial distribution of ATECO codes 15.1—"preparation and tanning of leather; manufacture of travel goods, handbags, leather goods and saddlery; dressing and dyeing of fur"—and 15.2—"manufacture of footwear"—reveals a strong geographical concentration of firms and workers in a limited number of Italian regions. In 2018, out of 35,723 active companies in the sector, 25.2% were located in Tuscany, with 9,019 firms, followed by Lombardy (15.6%), Marche (13.3%), and Veneto (13.1%). Slightly lower shares were recorded in Campania (10.2%) and Emilia-Romagna (6.7%). However, the number of firms does not correspond proportionally to the number of employees. In the same year, total employment in the sector amounted to 407,273 workers, with Campania alone accounting for 139,764 employees—over 34% of the national total—followed, in descending order, by Tuscany, Veneto, Lombardy,

2 Data processed by Unioncamere Veneto based on Infocamere data (2018). ATECO codes 15.1 and 15.2 refer to tanning activities and to the manufacture of leather goods, including footwear and handbags.

Marche, and Emilia-Romagna (Brunello, 2022). Although the available data do not allow a precise reconstruction of district boundaries, it is clear that certain segments of the supply chain tend to cluster geographically for technical and logistical reasons. This is the case, for instance, with wastewater recovery systems in Italian tanning districts such as Santa Croce sull'Arno in Tuscany, Arzignano in Veneto, and Solofra in Campania. District-based organization enables systemic waste management and facilitates the traceability of production processes. Other segments of the chain, such as handbag manufacturing, are instead characterized by fluctuating production volumes and therefore rely on networks of flexible and highly specialized subcontractors. This gives rise to production systems that can involve firms located at considerable distances from one another.

Labor costs remain a decisive factor in the overall cost structure of any product or process that requires skilled work. The concentration of employees in specific territorial basins demonstrates how the availability of specialized labor continues to anchor firms to circumscribed geographical areas. At the same time, the possibility of maintaining close economic relationships between different segments of the same supply chain reinforces the persistence of the district-based model.

Industrial districts play a crucial role not only in fostering innovation but also in preserving tacit, craft-based knowledge, which underpins Italy's international competitiveness (Bettiol, 2015, pp. 35–36). As economists Alberto Quadrio Curzio and Marco Fortis argue, districts pursue goals that go beyond purely economic objectives:

"The goals of growth and profit, which remain valid regardless of the organizational structure of the firm itself, are not the ultimate purpose of industrial districts. Within them there is also another objective, more or less explicit but clearly evident in certain district-based historical and social contexts: namely, the intergenerational continuation of the district community as a self-organized system." (Quadrio Curzio & Fortis, 2002, pp. 21-22).

The rootedness of each district within a specific "local society" defines a form of capitalism characterized by autonomous specialized firms, their mutual interconnections, and by "a shared equilibrium of knowledge and responsibility across the socio-economic groups that constitute the district" (Becattini & Bellandi, 2002, pp. 82–83).

The Italian competitive advantage no longer derives from low-cost labor but from a segmented and differentiated organization of the production process. In 1990, the American economist Michael Porter defined the notion of competitive advantage and proposed a particularly clear interpretation of the Italian economic system:

"The case of Italy is particularly interesting for a number of reasons. Italy is not generally known as a nation whose firms have competitive advantage in many industries. Its image is more of chaotic government, poor telephone and other public services, inefficient state-owned enterprises, and pervasive subsidy. Italy is also yet another important nation with few advantages in inherited factors of production. It imports most of its energy and raw materials and is even a net importer of food. Yet Italy developed a remarkable dynamism and a capacity to successfully upgrade competitive advantage in industries. In the early postwar period, Italy was a nation where most industries had competitive advantage based on low-cost labor. By the early 1980s, many Italian industries achieved advantage based on segmentation, differentiation, and process innovation. The Italian case, like that of Japan, illustrates the power of a growing alignment between national circumstances and the shifting demands of modern global competition" (Porter, 1990, p. 421).

Innovation processes can thus be attributed to the specialization of firms in specific phases of production, a characteristic feature of industrial systems operating within global markets where output is no longer oriented solely toward domestic demand. From this perspective, the integrity of the supply chain becomes a fundamental condition of productive competitiveness. In Italy, the district-based configuration of the fashion system began to take shape in the 1960s. During this period, large-scale industrial actors were already present (Garofoli, 1991, p. 91), yet the role of small firms became increasingly central. These enterprises were highly autonomous and strongly oriented toward

innovation. Their growing importance made it possible for production activities to be relocated and reorganized across different territories.

CONTEXTUAL KNOWLEDGE, DIFFUSE CREATIVITY, AND THE ROLE OF THE CONSUMER

In the economic literature, cooperation and competition are identified as the foundations of what Giacomo Becattini conceptualized in the late 1990s as *contextual knowledge*, formulated in *Distretti industriali e Made in Italy* (Becattini, 1998). Within this framework, the community-based circulation and preservation of knowledge inside a specific industrial district has significant implications not only for production, but also for creativity.
The sociologist Paolo Volonté, in *La creatività diffusa* (2003), argues that creativity, an attribute strongly sought after in fashion production, operates as a distributed system, spread across the entire spectrum of social positions and roles that make up the fashion system. As he writes:

"The industrialization of clothing in Italy after the Second World War led to a diffusion of the creative component that does not concern only the stylistic segments of the supply chain, but is highly significant across all stages of the industrial production process (pattern making, garment construction, quality control, distribution, and so on). In recent years, this creative dimension has extended as far as the consumer, who becomes an 'active spectator' in the fashion game" (Volonté, 2003, p. 12)

This understanding of creativity as a distributed and collective phenomenon has important implications for how the fashion system is analysed and taught. If creative agency is not confined to designers alone, but extends across modelling, manufacturing, quality control, logistics, and even consumption, then the boundaries between design, production, and use become porous.
In this sense, the supply chain is not merely a technical infrastructure, but a cultural and cognitive environment in which meanings, values, and forms are continuously co-produced. The growing visibility of consumers as evaluators of sustainability, ethics, and material quality further amplifies this dynamic. Their judgments feed back into the system, influencing both design decisions and industrial strategies. As a result, creativity today operates as a form of systemic intelligence that links aesthetic innovation to social and environmental responsibility. The role of the consumer, and, more specifically, consumer perception, has changed substantially in the contemporary fashion system. In the past, the value of a product was primarily anchored in its symbolic dimension, and therefore in ideas of status, belonging, and aspiration. Today, however, value is increasingly associated with the supply chain that produced the object. Demands for transparency, traceability, and environmental and ethical responsibility no longer originate only from regulatory bodies or niche groups of conscious consumers. They are now spreading across the global fashion market and directly influencing brands' design and production strategies.

Within Italian industrial districts, these new global pressures intersect with productive structures historically based on specialization and proximity. The entry of international groups into key nodes of the supply chain, the adoption of environmental reporting systems, and the growing need to optimize the use of resources are pushing firms toward increasingly circular models. In these models, waste reduction, by-product recovery, and the traceability of material flows become strategic factors of competitiveness. In this context, even seemingly minor design decisions, such as the choice of a type of leather, a lining, an assembly technique, or a finishing process, acquire systemic relevance. These choices affect not only the product's aesthetic qualities, but also its durability, its potential for repair, recycling, or reuse, and the measurability of its environmental impact across its entire life cycle. Creativity, therefore, no longer operates solely at the level of form, but increasingly as the capacity to negotiate technological, environmental, and productive constraints within the supply chain.

From this perspective, leather goods emerge as a privileged observatory of the transformations currently under way. It is a sector in which the symbolic value of the object, the materiality of the process, and responsibility toward both the consumer and the territory are recomposed into new projectual configurations. Bringing examples of industrial innovation and best practices in production management into a fashion design university context makes it possible to show

how stylistic choices generate tangible effects throughout the entire product development process and shape the reproducibility of products over time. A small but telling example can be found in a brand's decision to standardize zipper pullers across different bag lines and collections. Such a choice allows the optimization of resource use and the identification of the least energy-intensive production process for a small but highly distinctive component that must maintain its functional and aesthetic qualities over time in relation to product durability.

Introducing these discussions into the relatively open and protected environment of education makes it possible to address sustainability in a direct and tangible way, while also confronting the contradictions inherent in industrial production. The university is, in this sense, the place where an ethical awareness of creative practice must be cultivated, grounded in a concrete understanding of the production system. Promoting connections between different actors within the fashion system, from production to education, and acknowledging that fashion design addresses a global community of consumers makes it possible to think in terms of the common good. This approach establishes collective well-being as a central objective, while opening up new interpretations of the role of creativity within the fashion production chain.

EDUCATION, DESIGN, AND RESPONSIBILITY: THE RHITA CASE

The theoretical reflections developed in this contribution find concrete application in a series of pilot projects carried out within the research programme RHITA – *ResHaping Made in ITAly*, funded by the National Research Programme (PNR). RHITA is conceived as an interdisciplinary and multi-sited research platform, designed to bring together different academic perspectives on fashion, design, and applied social sciences. The project involves five Italian public universities that are active in these fields: the University of Campania "Luigi Vanvitelli", Politecnico di Milano, the University of Florence, the University of Siena, and the Università Iuav di Venezia. Through this institutional network, RHITA operates as a shared space for experimentation, comparison, and methodological exchange.

The project pursues a twofold objective. On the one hand, it aims to test new models of integration between different forms of education and research, encouraging dialogue between design-oriented, technical, and theoretical disciplines. On the other hand, it seeks to investigate, document, and valorize circular and sustainable models of Italian manufacturing. In this sense, Italian *saper fare* is understood not as a generic notion of craftsmanship, but as a complex system composed of human skills, technologies, tacit knowledge, and territorially embedded resources located in the regions involved in the project.

Within the RHITA framework, the Università Iuav di Venezia developed a cycle of teaching and design activities in close collaboration with three companies that represent different segments of the leather goods supply chain: Monde, a manufacturer of metal accessories based in the Vicenza area; BCN Concerie, a historic tannery located in the Santa Croce sull'Arno district; and Mabi International, a leather goods manufacturing company based in San Daniele del Friuli. These firms were selected not only for their industrial relevance, but also for their strategic position within the supply chain—accessories, raw material, and manufacturing—and for their inclusion in different industrial configurations, ranging from well-established district-based companies to firms integrated into international corporate groups. This configuration made it possible to analyse the development of handbags as a whole, highlighting roles, interdependencies, and critical issues along the value chain.

Following a series of meetings, company visits, and moments of exchange with the industrial partners, a group of undergraduate students in Fashion Design developed individual bachelor's thesis projects structured as design-based case studies. These projects were grounded in a *learning by doing* approach and in the logic of situated design. In particular, the projects by Sergio Ricchitelli, developed in collaboration with BCN Concerie [Fig. 01], and by Emma Di Bagno and Matilde Siena, developed in collaboration with Monde [Fig. 02] and [Fig. 03], were selected for their ability to make explicit the relationships between stylistic decisions, production constraints, and sustainability objectives.

In the first case, the project originated from the analysis of a batch of hides that had initially been intended for sampling and had not been selected for industrial production. Through a process

Fig. 01

of design reinterpretation and the application of specific surface treatments, this material was reintegrated into a new value cycle. The project thus demonstrated how reuse can be incorporated as a structural design strategy rather than as a residual or secondary solution. Both chromatic definition and object design were guided by the need to ensure compatibility between the material and existing aesthetic, functional, and production requirements. In this way, an industrial constraint was transformed into a creative lever.

In the case of Emma Di Bagno and Matilde Siena, their work focused on the development of a brass closure designed in close collaboration with Monde's technical department. This process required continuous negotiation between the students and company technicians in order to reconcile formal ambitions, technological feasibility, and the durability of the component. Their projects show how even an apparently minor element can in fact constitute a critical node within the supply chain, one that directly affects reparability, replaceability, and the overall lifespan of the product. Monde subsequently provided the students with data derived from Life Cycle Assessment (LCA) analyses of the component. This made it possible to integrate quantitative evaluation tools into the design process and to make the effects of design choices measurable.

Taken together, these cases illustrate that design in the leather goods sector cannot be understood as an isolated act. Rather, it must be seen as a practice of mediation between aesthetic intentions, production constraints, industrial logics, and environmental objectives. Only through a deep understanding of materials and manufacturing processes is it possible to meaningfully address the formal qualities of the final designed object. From this perspective, teaching activities acquire the value of research. They help to make visible dynamics that are often implicit within the supply chain and provide critical tools for educating designers who are aware of the productive contexts in which they operate.

The relational dimension of design that emerges from these pilot projects resonates with the reflections of Gabriele Monti, former coordinator of the Bachelor's degree in Fashion Design and Multimedia Arts at the Università Iuav di Venezia, who states:

"The academic activity carried out at Iuav also provides an active and concrete opportunity to reflect on the nature of the relationship between teaching, research, and fashion, within a community-based dimension in which both faculty and students are actively involved in a process that can be described in every respect as a 'relational process.' In the university context, the teaching and learning of fashion design can become a central space for reflecting on the relationship between practice and theory in fashion, and on the status of fashion itself in relation to academic research" (Monti, 2020, p. 99).

This perspective connects with Paola Colaiacomo's interpretation, according to which innovation in Made in Italy emerges when a system is ramified, permeable, and capable of continuously redefining its processes and goals through the work of a community (Colaiacomo, 2007). In the district-based contexts and in the university–industry collaborations activated by RHITA, this condition takes the form of the possibility to experiment,

hybridize, and challenge established solutions during phases of prototyping and material testing. It is in these moments that, as Richard Sennett observes, technical intelligence and imagination intertwine: the use of imperfect tools and materials stimulates the ability to repair, adapt, and improvise, turning design into an open-ended process in which form, function, and meaning are constructed simultaneously (Sennet, 2021). Within this tension between knowledge and *know-how*, between tradition and experimentation, a fertile space emerges for a renewed interpretation of Made in Italy, capable of combining productive heritage, innovation, and social responsibility.

CONCLUSION

The theoretical analyses and case studies discussed in this contribution show that the strength of contemporary Made in Italy no longer lies in cost reduction or in the purely symbolic power of branding. Rather, it resides in the capacity of firms to respond in a flexible, competent, and responsible manner to the demands of an increasingly complex and demanding global market. In the leather goods sector in particular, competitiveness is grounded in the ability to adapt quickly to change, in the quality of material transformation, in the optimization of production times, and in the adoption of manufacturing practices oriented toward environmental and social sustainability. These practices range from the reduction of waste to its revalorization as both a design and an economic resource.

In a country that is structurally poor in raw materials, such as Italy, value is not generated through extraction, but through transformation. It is through processing, through the combination of different forms of knowledge, and through the continuous reinterpretation of materials and technologies that the fashion supply chain builds its competitive advantage. Leather goods, with their integration of chemical, mechanical, and artisanal processes, constitute in this sense an advanced paradigm of how Made in Italy produces value

Fig. 02

Fig. 03

through the intelligence of processes rather than through the mere availability of resources.

In this scenario, globalization has undoubtedly expanded opportunities, but it has also intensified inequalities and competition among territories, firms, and individuals. For this reason, the role of educational institutions and applied research initiatives, such as the RHITA project, becomes central in promoting an ethical form of competition based not on the extraction of value, but on its circulation and sharing. When university education is intertwined with the productive supply chain, it can generate spaces of cooperation in which design becomes a tool for connecting skills, interests, and responsibilities.

From this perspective, the concept of care takes on a concrete and operational meaning: care for materials, for processes, for people, and for territories. Designing in fashion increasingly means being able to listen—to the needs of production, to the expectations of consumers, and to environmental constraints—and to translate this listening into formal and technical solutions. It is within the continuous exchange between embodied forms of knowledge and design visions that Made in Italy can continue to renew itself as a living system of relations, capable of combining creativity, sustainability, and shared value.

CAPTIONS

[Fig. 01] Sergio Richitelli, BA final project developed in collaboration with BCN Concerie/ph: Ilaria Toma/

[Fig. 02] Matilde Siena, BA final project developed in collaboration with BCN Concerie and MONDE Metal-on-demand/ph: Alessia Perina Aquilera/

[Fig. 03] Emma di Bagno, BA final project developed in collaboration with MONDE Metal-on-demand/ph: Chiara Pontiglione/

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THE YAMAMAY RELOADED CASE STUDY:

UPCYCLING AND SHARED VALUE IN SUPPORT OF THE ITALIAN FASHION SYSTEM

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Abstract

This study analyses the design methodology adopted in *Yamamay Reloaded* project, developed by the *Università degli Studi della Campania "Luigi Vanvitelli"* in collaboration with the social tailoring enterprise Prism S.r.l. and the Yamamay brand (Inticom S.p.A.). The project integrates upcycling practices applied to unsold garments from the fast fashion sector with principles of sustainable development and design strategies geared towards the responsible disposal and reuse of textile products destined for disposal, in relation to the sustainable and digital transitions that are affecting the Italian fashion system. The experiment aims to demonstrate how collaborative educational upcycling projects can act as generators of co-creation and value sharing between academia, industry, and the third sector. The research, therefore, interprets the project not only as an educational experience, but as an experimental model of collaboration capable of creating shared benefits by promoting the acquisition of design, technical, and systemic skills among the actors involved. Through an analysis of the methodology applied to the development of the collections, the contribution discusses the emerging role of the fashion designer within collaborative and circular processes, placing the *Yamamay Reloaded* experience within the theoretical and design framework of the *PRIN ResHaping Made in ITAly (RHITA) project.*

Keywords: *Upcycling, Transitions Fashion Design, Circular Fashion, Value Co-creation, Case Study*

THE YAMAMAY RELOADED NETWORK: TOWARDS NEW SUSTAINABLE TRAJECTORIES

The issues of sustainability and the circular economy have been widely discussed in the literature, with particular attention to upcycling practices, eco-design approaches and the role of education in promoting a design culture oriented towards sustainability (Fletcher et al., 2018; Moreira et al., 2025). At the same time, various types of collaborative models, living labs and multi-actor ecosystems have been analysed as "places" conducive to the development of innovation and the co-creation of value between academia, industry and the third sector (D'Itria et al., 2023). In this context, educational design and, consequently, academies, are privileged operational areas and infrastructures capable of observing and implementing experimental design practices that simultaneously act as pedagogical activities and concrete actions within collaborative ecosystems. Based on this theoretical framework, the *Yamamay Reloaded* project is a relevant case study for an integrated analysis of the dynamics of collaboration between universities, businesses and third sector actors in the Italian fashion system. The experiment highlights the interactions between training, production and sustainability, addressing in a concrete manner the issues related to overproduction, the management of unsold items and product traceability, which are central themes in the contemporary debate on the future of the

fashion system.
The *Yamamay Reloaded* educational/design experiment is an initiative developed on the basis of the *Fashion Alive* pilot project, launched in 2023 and funded as a competitive tender by the European Union. The proposal involved three European countries – Spain, Italy and Portugal – where the winning research project of the European call for proposals called *Creative Cult Europe* on the theme of sustainable development and upcycling was tested. The related activities involved the extensive participation of students – around 500 – teachers from various disciplines in the field of eco-sustainable fashion design, researchers and PhD students, providing a context for experimentation in which research and innovative teaching contribute to the dissemination of a culture of eco-sustainable fashion design (Liberti et al., 2023). This type of research has shown that sharing knowledge and bringing together different cultures, skills and abilities can generate shared value that can have an impact on sustainability issues such as upcycling in fashion design.

The *Yamamay Reloaded* project, on the other hand, promoted the same type of experimental activity by involving Yamamay, a fashion company, and Prism, a social tailoring enterprise, in the brief. This approach extended the design system from Campania to Lombardy, as both organisations are based in Lombardy. The 600 garments donated by Yamamay to the Fashion Design Degree Course at the *Università degli Studi della Campania "Luigi Vanvitelli"* were the first step in launching the project, which lasted for an entire academic year – first semester and second semester of the 2024/2025 academic year – and involved several stages before the closing and presentation of the final fashion show of the garments created, many of which were attended by the company's internal sustainable development staff and the CEO of Prism, the project's initiator.
In line with the current scenario in terms of sustainability and traceability and in relation to requests for compliance with EU regulations, a key factor has been the successful attempt to create a digital passport (DPP) for end-of-line products donated by the company through research conducted by *Antonella Violano* in the course of Technologies and Materials for Fashion Design, which has allowed for an in-depth study of an issue that by 2030 will have to be considered mandatory by luxury companies, but also by so-called fast fashion companies. This passport for fast fashion is a mandatory digital "identity card" for textile products, which tracks the entire life cycle of the garment, from raw material to recycling, ensuring transparency on materials, production, environmental impact and social conditions. It is accessible via QR/NFC code for consumers and authorities and is essential for sustainability and ESG compliance. Many companies, whether in the luxury, premium or fast fashion sectors, struggle to implement the technologies and processes necessary for traceability and data collection, which is why this process - studied with students and teachers in the *Yamamay Reloaded* project - requires a radical change in supply chain governance, which is often opaque and fragmented. The implementation of the DPP within the project has demonstrated how this digital tool is revolutionising the sector, as it will make the fast fashion model more transparent, ethical and compliant with regulatory and consumer expectations. It was very useful to link the issue of environmental certification to the design development phase of the new prototype created by each individual project team, as it highlighted how this aspect is the new challenge for fashion designers of the future, namely to create a product to be placed on the market that uses sustainable technologies, with an ethically transparent and "clean" production methodology thanks to the adoption, for example, by social tailors scattered throughout the territory and clearly traceable with a DPP. The focus on product traceability and its extension from unsold items to the creation of new garments determines the importance of research and experimentation centres which, thanks to the collaboration and support of other realities, can approach the redesign of production systems in the fashion sector.

SUSTAINABLE PRACTICES AND UPCYCLING AS STRATEGIES TO EXTEND THE FASHION PRODUCT LIFE CYCLE

The contemporary scenario of overproduction in the fashion system presents several critical issues and damages that cannot be attributed, in terms of sustainability, solely to the production and manufacture of the items themselves, but also to everything related to the product once it is finished, sold and unsold. Global estimates of waste

production report that approximately 92 million tonnes of textile waste are generated worldwide each year, a quantity that is constantly increasing due to the growth in clothing production and consumption volumes. Most of this waste is not reintegrated into production cycles but is destined for landfill or incineration due to low recycling and reuse rates, generating negative impacts in terms of natural resource expenditure, loss of raw materials and greenhouse gas emissions (United Nations Environment Programme, 2025). The abnormal amount of waste indicated represents a major problem in terms of environmental, social and economic sustainability, which is why the reintegration of unsold goods is being analysed by the academic world. Overproduction itself results in a quantity of products that are manufactured but not sold and returned to manufacturers, which is a real critical issue both for the company's economy and, above all, for the pollution of the planet. Recent studies relating to the European Union identify percentages between 4% and 9% of textile products placed on the market but then destroyed before their actual use, due to practices for managing unsold items and returns (European Environment Agency, 2024) that are not limited to necessary production but are the result of production exceeding actual demand. These significant figures represent focal points on which the world of research and the European Union are committed to implementing strategies and plans to resolve the issues they cause. For these reasons, the critical issues identified are increasingly becoming a focus of interest for the fashion industry, which is progressively adopting sustainability-oriented strategies, including eco-design, transparency and traceability, reduction of environmental impacts, reuse, recycling and upcycling, often integrated into circular economy models (Ellen MacArthur Foundation, 2017; Fletcher et al., 2018). It is therefore useful to integrate upcycling practices into design processes, particularly in the field of fashion design. Studies show that this activity is not only a material management strategy, but also a design approach that can be applied to the post-production stages of the fashion system (Aus et al., 2021). In this way, new value is given to unsold garments, returns or textile waste. Unlike traditional recycling, which often involves a downgrading of materials, upcycling aims to preserve or increase the functional, aesthetic and symbolic value of the product, contributing to the extension of its life cycle and the reduction of waste production. Furthermore, upcycling is associated with the development of new materials and design languages that reinterpret waste as a creative and productive resource, strengthening the role of design as a tool for transformation within circular fashion systems (Castro & Schmidt, 2025). When applied to circular economy models, this approach leads to a rethinking of the design, production and end-of-life management processes, encouraging relationships that involve greater responsibility between industry, product and resources (Ellen MacArthur Foundation, 2017; Fletcher et al., 2018). The *Yamamay Reloaded* project is therefore structured with a view to transforming unsold garments destined for disposal into new material to be reintroduced into production processes.
In consideration of the theoretical framework and context outlined above, the *Yamamay Reloaded* case study is adopted as an analytical tool to address the following research questions:

RQ1. How can an educational upcycling project be configured as a collaborative model capable of generating shared value among academia, industry, and third sector actors in the fashion system in order to achieve progress in sustainability-related processes?

RQ2. What role does the fashion designer play within these collaborative ecosystems, particularly in mediating between design, production, social and environmental dimensions?

SHARED VALUE IN COLLABORATIVE SYSTEMS OF FASHION DESIGN

In line with the concept of *Creating Shared Value* (Porter & Kramer, 2011), the value generated by a project is not limited to the economic dimension, but can be understood as a process capable of producing shared social benefits. In the context of design project development, this value can be interpreted as the result of interaction between different actors, whose contributions generate positive effects both for those involved and for the wider context. More recent studies have also highlighted how collaborative value creation processes are particularly relevant in contexts characterised by complex, multi-stakeholder supply chains, such as the textile and fashion industry (DiVito et al., 2021). For this reason, a company's

ability to generate competitive advantages and consequent economic returns, together with the relative production of positive social and environmental results for the parties involved, determines the production of shared value (Mio, 2021). For this change to take place, it is necessary to forget the logic applied to a type of supply chain considered closed and instead promote systems of exchange, interaction and connection between institutions, public administrations, third sector organisations and, in some cases, even competitive companies. Companies that are preparing for this change - configuring themselves as open and hybrid entities (Belletti, 2023) - differ from others in that they can develop circular supply chains and integrating heterogeneous resources, managing to extend their value chain beyond company limits. About this vision, therefore, the extended value chain involves structured relationships with economic, institutional and social actors, facilitating the formation of collaborative ecosystems capable of producing shared and enduring impacts.

Based on these observations, the *Yamamay Reloaded* project lays the foundations for a systemic collaborative model in which academic institutions, manufacturers and third sector entities act jointly to generate shared value. To respond to contemporary sustainability challenges, such as extending product life cycles and innovating processes through new practices that are more suited to protecting the planet, the project brings together the skills, figures and differentiated actions of stakeholders, establishing cooperation between universities, companies and social tailoring enterprises, generating a new strategy for sustainable development. Diving into the system, we can analyse the roles of the parties involved and their respective operations, so that their skills and actual actions are clarified.
In this case, the university acts as a knowledge processor through the development of research emerging from projects and new experiments applied to unsold garments. The production of theoretical and design research has enabled the configuration of future scenarios and visions determined by overproduction and pollution, while at the same time intercepting the social, cultural and productive developments currently underway. The ability to first transfer theoretical research into the structuring of contemporary scenarios and then translate them into new imaginaries has determined the growth in terms of the company's wealth of knowledge and inspiration. It therefore emerges that the university is not merely an observer, but an active player capable of catalysing and innovating through the production of both new visions and new styles and experiments through the development of new models. It offers methodologies, tools and approaches that are difficult to experiment with in traditional production contexts today.
The role of social tailoring enterprise, on the other hand, has been that of mediator between academia and industry, representing a key function within the project and the system. It acts as a concrete interpreter between the needs of the other two parties involved and, thanks to the skills of its operators, the selected garments can be incorporated into the company's production chain. PRISM is the real link between the university and Yamamay. In this sense, it becomes the place where its internal ethical values are transferred to other entities that extend beyond the closed boundaries of the company. Furthermore, the presence of a reality particularly linked to know-how, understood as the ability to create garments in an artisanal way, has allowed students to learn alternative technical and production solutions, managing to enhance their projects through upcycling practices based on manual processes and production that is attentive to people and contexts. Social tailoring enterprise, therefore, helps to connect universities and businesses by transferring the experimental university phase into a possible industrial application. This step is particularly significant in relation to the system that the project aims to create, as it allows for the real feasibility of the design solutions developed by the students and enables an understanding of their actual scalability from research to industrial production, without neglecting the ethical and social values that distinguish social tailoring.
The company's participation, on the other hand, was fundamental to the success of the project, as it provided the raw material necessary to undertake the project development: unsold garments. By donating the material, Yamamay made it possible to transform dead stock products from potential waste into a project resource, effectively facilitating the extension of the garments' life cycle. Considering the possible creation of new styles designed by students and produced by the social tailoring

enterprise, the enterprise expands its production process into new, unconventional areas capable of experimenting with innovative, responsible models and creating value.

The *Yamamay Reloaded* project, in its entirety, can generate a system that can bring expandable benefits to all those involved. The university consolidates its role as an innovator and applicator of research, which it transfers to the company that has provided the materials, while at the same time acquiring knowledge from the tailors; the tailors, as a mediator between the university and the company, acquires new practices from the university and the possibility of producing garments; through the transfer of materials, the company not only solves an internal problem, but also extends its vision beyond its limits, enriching it through the work of the university and the production of the social tailors. The project has therefore generated a collaborative ecosystem capable of producing cultural, social and economic value, providing tangible benefits to each participant and demonstrating that shared value allows for the definition of new trajectories capable of contributing to a more comprehensive reflection on the future of production processes in the fashion industry, considering sustainability in a broader and more systemic sense [fig. 01].
In this sense, the *Yamamay Reloaded* case provides empirical evidence in relation to RQ1, showing how an educational upcycling project can be structured as a collaborative model of shared value creation within the fashion system.

DESIGN APPROACH TO THE DEVELOPMENT OF COLLECTIONS FOR YAMAMAY RELOADED

In order to facilitate understanding of the dynamics employed in the collections created as part of the *Yamamay Reloaded* project and to answer RQ2, it is necessary to understand the methodology applied to the design development. For this reason, the following paragraph is accompanied by illustrations

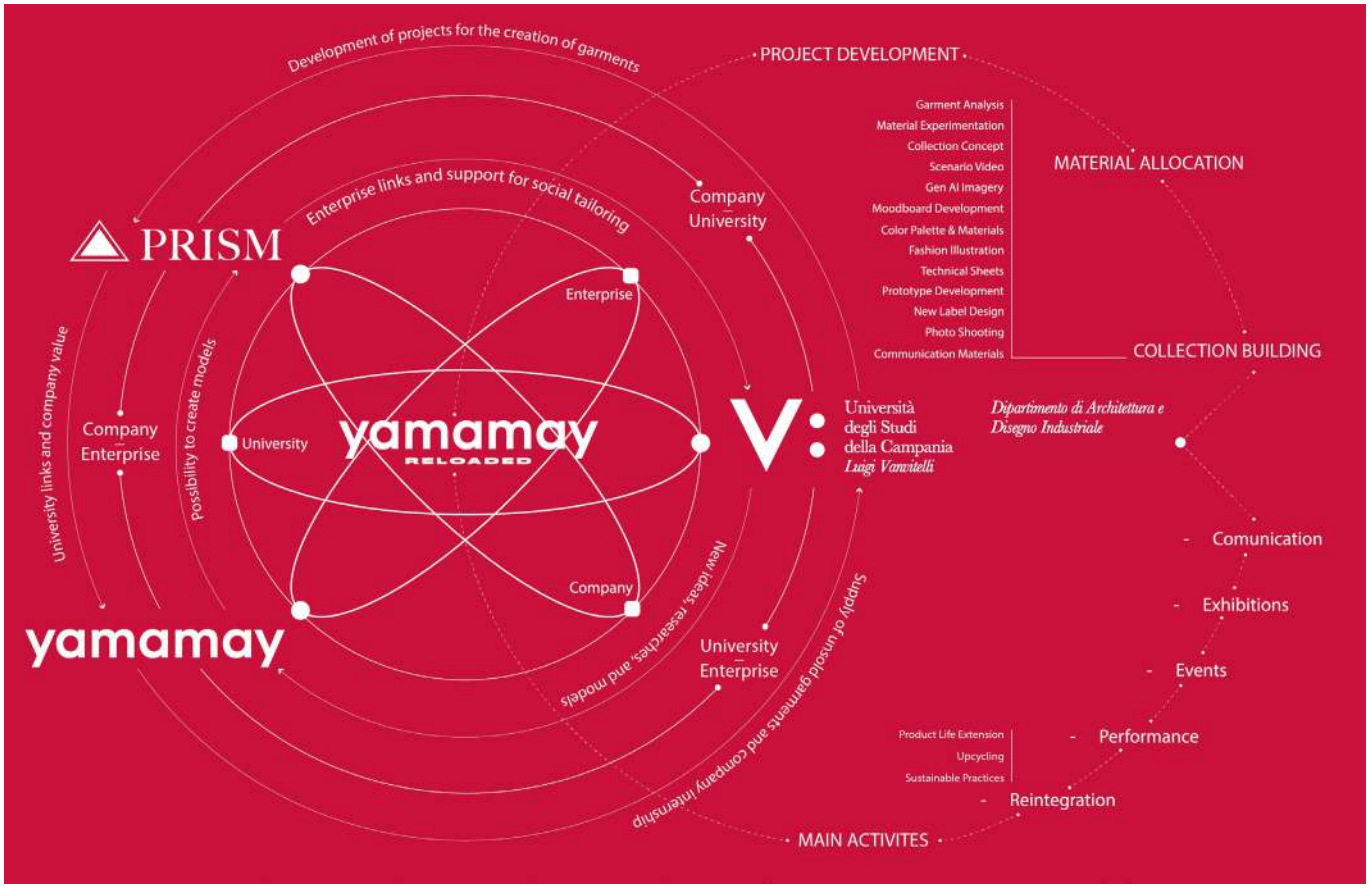

Fig. 01

of the key points that characterised the *Textile Soul: Storie di fili eterni* project[1] during the Fashion Eco Design Laboratory 1 of the Master's Degree Course in Design for Innovation (Fashion Eco-Design *curriculum*), considered particularly comprehensive and exhaustive for the purposes of analysing design development. The process involved two main phases: the first relating to the division of materials and the second concerning the structure of the steps necessary for the development of the collection.

RESOURCE ALLOCATION

In order to obtain the best possible result, all parties involved actively participated in the several stages that constituted the complex development of the project. Once the material was acquired from Yamamay – approximately 600 unsold items – in the first stage, it was divided among the different study courses that participated, particularly the laboratory courses. A progressive logic was applied to the distribution of the material, determined by the level of expertise of the different years of the course. First of all, the methodological choice to divide students into groups of 5–6 aims to simulate the collaborative dynamics typical of real design and production contexts. The garments were assigned in such a way as to create comparable design conditions, useful for observing how material and production constraints can influence upcycling strategies and design results. For example, first-year students on the master's degree course - Fashion Eco Design Laboratory 1 - were given garments with uniform product characteristics and in limited numbers compared to the rest of the available material, so that they could work with greater difficulty and with methodological processes appropriate to the master's course. In particular, for the *Textile Soul: Storie di fili eterni* collection, around ten homewear garments were assigned, specifically knitted cardigans characterised by a cream-coloured yarn.

1 The project was carried out by a working group composed of students Marco D'Antuono, Lorenza De Monte, Bartolomeo Gentile, Tullio Iandolo, and Serena Polverino.

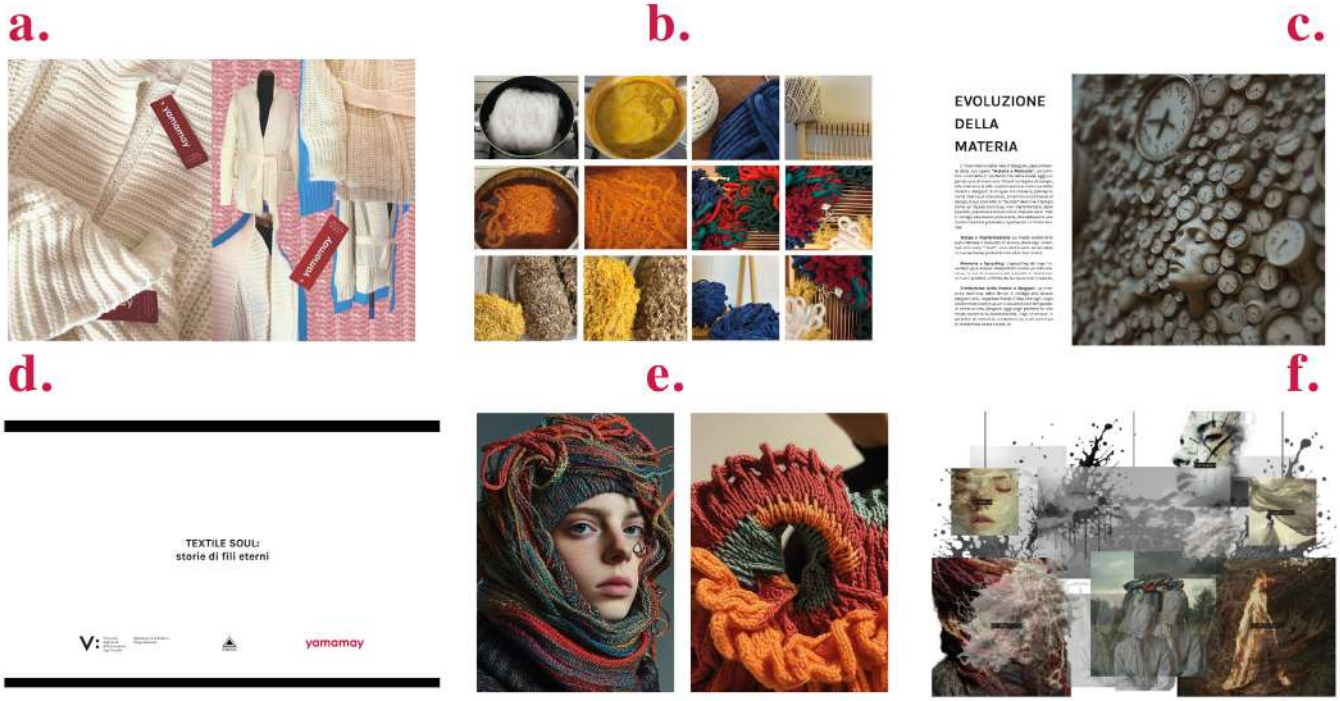

Fig. 02

The choice of this type of assignment was therefore determined by a limited number of garments, the desire to use a single material, product category and colour. For the third year of the three-year degree course - Fashion Design Laboratory 3 - the assignment involved fabrics with floral patterns characterised by different illustrations, colours and materials. The choice of this assignment was determined by the need to implement more complex colour combinations, processes and technical skills than in the first and second years of the three-year degree course. Unlike the first- and second-year students on the three-year course, they were provided with less elaborate fabrics and patterns: single-colour fabrics and single-pattern animal prints, combined with single-colour fabrics. Once the garments had been divided among the teams, after analysing the garments received from the company, they were asked to design a capsule collection and to create two prototypes for each group for the second- and third-year bachelor's degree students and first-year master's degree students, and one for the first-year bachelor's degree students. The decision to create two prototypes was motivated by the intention to project the design methodology for the new garments along two distinct trajectories: the first aimed at possible serial production and therefore the development of garments that could be reintroduced into Yamamay's production process with the help of the PRISM social tailoring company; the second designed so that students could push themselves to create a performance garment, designed for participation in the end-of-year fashion show organised by the Department. In the case of the first year of the bachelor's degree course, only the performance garment was required.

PROJECT DEVELOPMENT OF THE COLLECTION

In order to provide an overview of the activities carried out during the project development phase, the stages of the process adopted for the design of the collections created by each working group are described below. Based on skill levels and course structure, the process was adapted to suit the activities possible and differentiated according to the different years. In particular, reference is made to the stages carried out by first-year students on the master's degree course. The project consisted of a structured series of operational and research phases with the aim of developing capsule collections by applying upcycling practices to existing garments. Once kits of approximately 10-15 garments (based on Yamamay garment sizes) had been assigned, which formed the basis of the design process, they were subjected to in-depth analysis by the students. This included their intrinsic characteristics, considering colours, finishes, patterns and types of fabrics and, of course, the actual amount of material that could be used for the design of the prototypes [fig. 02, a]. Identifying the potential and limitations of the garments assigned in relation to the upcycling interventions necessary for the success of the project was fundamental to consciously guide subsequent design choices. Starting from the materials received, a phase of technical and material experimentation was launched, conceived as a tool for exploring the potential for transforming existing garments. In a laboratory setting, the techniques adopted - including fabric manipulation, laser cutting, re-dyeing and deformation - served as design practices aimed at formally and materially redefining the original garments. The experimental process led to the development of new solutions based on the analysis of the original garments [fig. 02, b]. Acquiring information about the starting material allowed the students to work with greater awareness and move on to constructing the scenario. At this stage, references from fields such as literature, visual arts, cinema and design served as interpretative tools, allowing the students to structure a coherent imaginary and define the concept of the collection in relation to both the characteristics of the materials and the cultural context of reference [fig. 02, c]. Subsequently, an introductory video was developed as a narrative tool of synthesis, necessary to explain the cultural context in which to place the capsules [fig. 02, d]. For the master's course, the next phase involved the production of evocative images using generative artificial intelligence tools. The following step demonstrated how new technologies can support the construction of a shared imaginary and visualise complex design scenarios in fashion design [fig. 02, e]. These images, together with the keywords of the collections and other visual references within conceptual mood boards, made it possible to structure a comprehensive view of the scenario and guide subsequent design choices [fig. 02, f]. The mood boards proved to be a means of mediation between conceptual research and design, allowing the definition and interpretation of

Fig. 03

colour palettes and materials [fig. 03, g]. The design process then continued with the development of sketches using manual and digital techniques [fig. 03, h], ensuring the verification of formal and stylistic aspects and visual consistency with the defined scenario, acting as a transition from the conceptual to the prototypical dimension. Technical data sheets were then drawn up for the garments to be prototyped in order to understand the models, also with a view to their possible reintroduction into the Yamamay production process [fig. 03, i]. The disassembly of the initial garments and the subsequent reworking of the models proved to be a critical phase in the development of the collections, as constructing new models from existing garments highlighted the role of production constraints as active elements of the project, guiding formal and construction choices towards solutions compatible with upcycling [fig. 03, l]. The project development included the creation of a new narrative label to communicate the transformation and traceability process achieved by the project [fig. 03, m]. Finally, communication material was created to systematically document and report on the entire design process for each collection, including the work in progress, the final editorial [fig. 03, n], the photo shoots and video content [fig. 04].

Beyond its operational structure, the design process adopted in the *Yamamay Reloaded* project can be interpreted as a mediation infrastructure between educational objectives and industrial constraints. The structured organisation of the work and the iterative prototyping phases allowed students to confront the real limits of production while experimenting with circular design strategies. From a research perspective, this highlights how design training based on upcycling can function not only as an educational exercise, but also as a testing ground for collaborative design methodologies that are potentially transferable within the fashion system.

THE FASHION DESIGNER AS AN INFORMATIONAL CATALYST IN SUSTAINABLE FASHION COLLABORATION

In this scenario, fashion designers take on a role

Fig. 04

that goes beyond the traditional creative dimension, acting as mediators between diverse knowledge, practices, and actors. This interpretation is consistent with perspectives that view fashion design as a practice capable of facilitating transitions and activating processes of change within complex systems, as well as with more recent reflections on the repositioning of designers in the contemporary fashion system (Frisa, 2022; Sakaue et al., 2023). Regarding the design development of the collection and, consequently, the structured vision of the project, the fashion designer is a key figure within the collaborative ecosystem, assuming a central and strategic role. If the university, social tailoring and the company are the main poles dedicated to the dissemination of information, management and production, the fashion designer - represented in this operation by the students - becomes the catalyst for information flows and the consequent translator of these into concrete design solutions. By gathering input, constraints and opportunities from the other actors involved, but also from outside, the designer acts as a synthesiser and re-elaborator of coherent and shared projects.

From this point of view, the role of the fashion designer is gradually moving away from that of a simple creative to take on a more complex and systemic dimension. This evolution of the figure is consistent with the vision in which the new skills needed to deal with the so-called "twin transitions" - intended as the interconnection between ecological transition and digital transition - are increasingly central and essential to implementing the desired environmental, social and economic changes (Belletti, 2023). Designers are no longer confined to imagining shapes and languages, but have become interpreters of diverse demands, mediators of divergent needs and processors of abstract visions into operational practices. The *Yamamay Reloaded* project clearly demonstrates the transformation of the role of fashion designers. Through the active participation of the students, interaction between the various players in the system was achieved. Their design contribution, in fact, transferred the connections between the university, social tailoring and the company from the theoretical to the practical level, thus achieving tangible results and validating and concretising

the shared value generated by the system through products, processes and narratives capable of restoring meaning and coherence to the entire process. This was made possible through upcycling, conceived as a sustainable practice of transforming and valorising the pre-existing, projecting them from learners of sustainability theories to active agents of change through the collections. At the same time, using digital tools and new technologies, they expanded the operational possibilities and simplified the processes by integrating the design dimension with digitised practices. The combination of sustainability and technological innovation has produced results that meet the demands of academic institutions, enterprises and social tailoring, while also aligning with European trajectories and the transition scenarios currently underway.

These observations and the operations carried out in the methodology applied for the development of the *Yamamay Reloaded* project collections directly address RQ2, emphasising the role of the designer as a mediator within collaborative and circular fashion ecosystems.

CONCLUSIONS AND DISSEMINATION

The *Yamamay Reloaded* project was certainly a pilot case for the development of experimental teaching involving a network of companies that are so diverse and interested at different levels in environmental sustainability and the role that eco-fashion designers must have in the green and digital transitions currently underway. In this sense, the connection with PRIN *RHITA* was fundamental because it allowed us to participate in the various intermediate steps and verify the practicality of specific issues while also participating in the results achieved during the project year, which coincided with the PRIN timeline. It was essential to analyse the role of the eco-fashion designer of the future in order to develop new design methods based on a detailed analysis of the ESPR (Ecodesign for Sustainable Products Regulation), a key European Union regulation for eco-fashion and the textile industry adopted in 2024, which establishes a regulatory framework to make almost all physical goods placed on the EU market more sustainable, durable and circular (European Union, 2024). The clothing sector will be among the first to be affected by these measures, and the *Yamamay Reloaded* project has proposed an experimental educational activity based on the principles of this regulation, which will enable Europe, and Italy in particular, to become a trailblazer in global regulations on eco-sustainable fashion. In our opinion, this should be the fundamental role of public universities about the involvement of private stakeholders and social partners in the "conscious" development of the project in the field of fashion design.

The dissemination phase of the *Yamamay Reloaded* project made the results of experiments conducted in academic and industrial contexts visible and verifiable. The fashion show and end-of-year award ceremony, in addition to their informative function, represented an external validation of the project, facilitating direct dialogue with the partner company and the relevant production system, giving the winning students the opportunity to undertake an internship at the Yamamay style office. In the same way, the presentation of the project in Milan as an Italian pilot case, at the opening of Prism Italia's repair and upcycling centre, highlighted the initiative's ability to go beyond the local context and become part of a wider debate on the future of the fashion system. The transfer of a project born in a university in southern Italy to an industrial context and its national dissemination through cohesion with realities in northern Italy highlighted the need to develop systemic models of collaboration in support of Made in Italy, capable of strengthening its competitiveness on the international scene.

This research is based on a single case study developed within a specific institutional and industrial context. Therefore, the results cannot be generalised in a statistical sense, but rather offer contextualised insights into collaborative upcycling practices in fashion design education through exchanges obtained from shared value between the parties involved and a methodology geared towards collection development, showcasing new possible approaches for tomorrow's fashion designers.

For this reason, the *Yamamay Reloaded* project identifies a series of transferable principles - such as the integration of educational institutions into circular value chains together with enterprises, the involvement of social tailoring companies as mediators, and the use of upcycling as a design-oriented strategy - that could inspire future

collaborations between academia, industry, and third sector actors in different fashion contexts.

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CAPTIONS

[Fig.01] Luigi Chierchia; Mapping of value-sharing processes and project development within the Yamamay Reloaded design ecosystem; Author's elaboration.

[Fig.02] Marco D'Antuono, Lorenza De Monte, Bartolomeo Gentile, Tullio Iandolo, Serena Polverino; Project development phases of Collection 1, shown as a composite image – "Textile Soul: Storie di fili eterni"; Credits of the project authors.

[Fig.03] Marco D'Antuono, Lorenza De Monte, Bartolomeo Gentile, Tullio Iandolo, Serena Polverino; Project development phases of Collection 2, shown as a composite image – "Textile Soul: Storie di fili eterni"; Credits of the project authors.

[Fig.04] Marco D'Antuono, Lorenza De Monte, Bartolomeo Gentile, Tullio Iandolo, Serena Polverino; Prototype shooting for the collection "Textile Soul: Storie di fili eterni"; Photography by Giovanni De Blasio. Credits of the project authors.

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WELLNESS TEXTILES.

REGENERATION OF LOCAL PRODUCTION SYSTEMS FOR INTEGRATED APPLICATIONS IN THE TEXTILE SECTOR

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Abstract

This paper proposes a design research approach based on the concept of Adaptive Doing, understood as an operational strategy for regenerating production systems and valorizing local resources within the Wellness Textile sector. Adaptive Doing is conceived as a dynamic, situated design paradigm that integrates adaptive processes and experimental practices oriented towards sustainability, well-being, and territorial resilience. In this perspective, the project functions as a mediating device between social, environmental, and technological transformations, translating them into concrete opportunities for innovation and local development. Developed within the RHITA - ResHaping Made in Italy project, the study emphasizes the centrality of place-based knowledge, productive vocations, and tangible and intangible resources as strategic levers for regenerating the fashion system and reinforcing its ties to textiles. Qualitative research, conducted through interviews and direct observation in two representative Campanian production contexts and complemented by evidence-driven experimental laboratory practice, enabled the translation of findings into design solutions and operational models for innovative applications. Adaptive Doing acknowledges the complexity and uncertainty of contemporary contexts and promotes future-oriented design based on the principle of Rethinking Resources. Results highlight how this approach can trigger sustainable regeneration processes, foster second-generation circular value chains, and strengthen local economies through new forms of territorial collaboration.

Keywords: *Adaptive Doing, Wellness Textile, Sustainable and Circular Design, Materials Innovation, Territorial Regeneration*

INNOVATION AND REGENERATION IN LOCAL PRODUCTION CONTEXTS

This contribution is situated within the contemporary debate on the transition toward sustainable, circular, and territorially rooted production models, with a specific focus on the textile sector and its evolution in terms of raw materials, processes, and technologies. In an era marked by the recognition of planetary boundaries (Steffen et al., 2015; Rockström et al., 2009) and the vulnerability of global supply chains, the urgency of a systemic shift to replace fossil-based raw materials with bio-regenerative ones becomes evident. The investigation strategically focuses on Wellness Textiles, identified as a segment of the textile industry that allows the intrinsic properties of natural resources to be valorized. Through the integration of enabling technologies and low-impact processes, textiles cease to be mere semi-finished products and become functional devices that promote user well-being and the resilience of local production systems. The theoretical and operational framework is based on the adoption of the Adaptive Doing (AD) paradigm, understood as a cultural and design approach capable of integrating action, experimentation, and continuous learning to respond to the complexity and uncertainty of socio-technical and environmental systems. As proposed by Rawluk et al. (2020), AD is a transformative practice aimed at promoting co-design processes with and for people through non-conventional methods,

emphasizing critical reflection and awareness of action within constantly evolving contexts. The AD process unfolds in an iterative cycle of four phases: disruption of the status quo to open the way for change; critical reflection and discussion aimed at acquiring new knowledge; shared re-conceptualization into a concrete action plan; and return to practice with a transformed perspective. AD emphasizes conscious and responsible doing, oriented toward anticipating and managing the unforeseen, integrating rational, empirical, and experiential dimensions of knowledge. Applied to local production contexts, it allows proactive interpretation and response to social, technological, political, and environmental changes, promoting circular and regenerative practices. Within this framework, AD intersects with the principle of Rethinking Resources (Thomsen et al., 2024), which proposes a systemic reinterpretation of territorial resources, moving beyond the traditional view of resources as merely material inputs. Resources encompass primary and secondary materials, waste, immaterial flows, local skills and knowledge, production infrastructure, and human capital, framing the economic, social, and environmental potential of resources and integrating advanced tools and methodologies such as digital modelling, circularity-oriented design, digital material passports, and Life Cycle Assessment (LCA).

Systemic valorization of primary and secondary materials considers qualitative analyses, understanding their evolving uses, and applying Design for Circularity principles, aiming to regenerate ecosystems and create extended mutual benefits. This broadens the concept of sustainability beyond merely reducing environmental and social impacts, emphasizing the capacity of ecosystems to absorb and regenerate, following principles of restoration, repair, reconstruction, and regeneration of natural stocks. Rethinking resources connects to an evolved conception of well-being, understood as an integration of physical, mental, emotional, social, spiritual, and environmental health, as suggested by the One Health approach, which recognizes the close interconnection between human, animal, and environmental health (WHO, 2018; Lirussi & Ziglio, 2021). Contemporary environmental challenges, such as pollution, resource exploitation and degradation, and global warming, require integrated preventive strategies that promote sustainable resource use and continuous ecosystem monitoring. Reflections on traditional natural therapies and smart therapies, supported by advanced technologies, allow for personalized and remote interventions, contributing to the improvement of individual psychophysical well-being (Cohen, 2004; Bell et al., 2020).

Simultaneously, innovation in bio-functionalized materials, designed to release active ingredients in a controlled manner over time, opens new opportunities for integrating textile design with preventive cosmetics and nutraceuticals, addressing needs related to health, muscle recovery, and skin protection (Thakker et al., 2020; Negi et al., 2024). Additive Manufacturing technologies further expand design possibilities, enabling the development of multifunctional, sustainable solutions combining natural fibers, bioactive extracts, and technological components. In textile-based applications, such as knitting, three-dimensional layers can integrate sensors and conductive materials, creating intelligent and active systems capable of real-time monitoring of physiological parameters and supporting health prevention and individual well-being, paving the way for new Wearable Wellness solutions with enhanced performance (Gurova et al., 2020). These innovations require a systemic design approach capable of managing contextual complexity and promoting integrated solutions through stakeholder engagement and knowledge sharing, encouraging multidisciplinary collaboration among public institutions, research laboratories, and companies. The objective is to build ecosystems of sustainable innovation, in which knowledge, technologies, and territorial resources converge toward common goals while ensuring resilience and adaptability (Bistagnino, 2009; Manzini, 2010; Tamborrini et al., 2018). Engaging with the territory as a complex socio-ecological system requires methodological tools capable of translating this vision into progressive structural changes, broadening the notion of sustainability toward repair, restoration, and regeneration of systems (Sbordone et al., 2022), integrating biological principles into design processes and promoting circular regeneration of resources. In this regard, innovation is recognized as inherently linked to social and environmental contexts, and multidisciplinary cooperation is essential for developing sustainable and long-lasting

solutions. Based on the principle that the outputs of one system become the inputs for another, circular flows of knowledge and resources are promoted, supporting the design of resilient, self-regenerating systems (Gaiardo et al., 2022; Luthe, 2020). Regarding the perspective of regeneration, design allows ecological and social crises to be approached as opportunities for multidimensional innovation, implementing interventions of repair (immediate actions to halt ecosystem deterioration), restoration (strengthening human-nature connections by combining technological innovation and natural resources), and regeneration (creating resilient socio-ecological systems capable of self-regulation in the long term). AD materializes in the pursuit of environmental, social, economic, and political benefits, conceptually integrating biological principles into design practice and promoting the resilience of socio-ecological systems and the symbiosis between human activities and nature (Antonelli, 2019; Benyus, 2022; Sbordone et al., 2022)**.** The RHITA project aims to revitalize Made in Italy through a process of reshaping the production system and the accumulated knowledge of the fashion system, representing a privileged field of application for principles inspired by *Adaptive Doing and Rethinking Resources*. In the context of *Made in Italy*, this means, on the one hand, sustaining historically consolidated local production realities and guiding them toward sustainability through resource rethinking, whether tangible or intangible. Materials, processes, and products will be reimagined in line with innovation themes, while on the other hand, the intrinsic qualities of Italian production landscapes will be enhanced, valuing history and local knowledge, and generating environmental, social, and economic value at both territorial and individual scales.

METHODOLOGY

The research adopts a mixed-methods approach, implementing Adaptive Doing through a combination of qualitative tools, direct observation, and design experimentation. The methodological aim is to build situated and operational knowledge capable of evolving in response to evidence gathered throughout the research process. The method is articulated in two main components: *(i) Semi-structured qualitative interviews and direct field observation.* The qualitative investigation targeted key actors within the local textile value chain, selected through purposeful sampling, and focused on two manufacturing realities representative in terms of history, production specialization, and territorial significance. Interviews involved companies with a strong local anchoring, aiming to explore perceptions, operational practices, and structural challenges related to the sustainability and circularity of textile processes. In particular, the analysis addressed topics such as waste and by-product management, the impact of environmental and waste management regulations, value chain governance models, and the relationship between traditional craftsmanship and technological innovation, as well as opportunities for valorizing the local textile landscape.

Direct field observations supported the contextualization of collected information, allowing verification of production processes, daily practices, and organizational dynamics, contributing to a critical and situated understanding of the strategies adopted by firms in their transition toward more sustainable and circular textile models; *(ii) Experimental approach to Textile Design.* The research employs an experimental design approach aimed at constructing application scenarios capable of innovating existing textile productions and exploring new opportunities within the Wellness Textile domain. Materials, processes, and prototypes are developed through iterative cycles of design, experimentation, and evaluation, positioning the project both as an investigative tool and as a final output. The design process begins with the definition of the Textile Concept and functional keywords, which guide the translation of the concept into visual and material choices through moodboards, color palettes, and chromatic combinations. Subsequent material exploration, formalized in a materials folder, allows for evaluation of coherence between sensory qualities, technical performance, and potential applications. The Textile Design Process translates the concept into operational textile configurations through modular and parametric patterns developed in CAD environments, supported by technical datasheets and a prototyping and testing phase aimed at verification, learning, and progressive refinement of design solutions. Although the methodology is structured around two main components, (i) semi-structured qualitative interviews and direct field observation, and (ii) an experimental approach to Textile Design, these

activities are embedded within the four iterative phases of the Adaptive Doing (AD) approach introduced in the Introduction.
The first phase, *Disruption / Exploration*, concerns the conduction of semi-structured interviews and direct on-site observation, through which operational constraints and emerging opportunities within the textile production system are identified. These elements make it possible to challenge consolidated assumptions, opening the need for new approaches to material circularity and textile applications oriented toward well-being.
The second phase, *Critical reflection*, involves the discussion and critical examination of the empirical evidence collected during Phase 1 in relation to the main sustainability frameworks and the emerging needs of users and local production contexts. This reflective process enables the definition of intervention priorities. The third phase, *Reconceptualization*, translates the insights that emerged during the reflection phase into design concepts through the identification of functional keywords, mood boards, color palettes, and preliminary material explorations. These activities structured the development of textile scenarios. The fourth phase, *Return to practice / Iterative prototyping,* highlights the iterative dimension of the AD approach. This phase materialized through cycles of prototyping, the use of technologies, pattern refinement, and testing of textile configurations. Each iteration generated new knowledge and adjustments, leading to the consolidated outputs presented in Sections 4.1 and 4.2.

QUALITATIVE ANALYSIS AND EVIDENCE

CASE STUDY: COMPANY A

The interview conducted with a historic textile manufacturing company in Southern Italy provides significant insight into the current dynamics and structural contradictions of the textile sector, particularly in relation to circularity, the valorization of natural vegetable fibers, and the relationship between traditional production and regulatory transformations. One of the most notable aspects that emerges is the company's deep historical roots in the territory, dating back to the early 20th century. Its initial specialization in hemp weaving, a fiber historically cultivated and processed locally, represents an emblematic example of an integrated supply chain, in which agricultural production, industrial processing, and end uses were closely interconnected. The subsequent transition from hemp to flax, necessitated by the ban on hemp cultivation, is not described as a rupture, but as an opportunity to reconfigure consolidated production knowledge. Flax, a noble fiber and a symbol of high-quality textile tradition, although representing a quantitatively limited niche, allows the company to position itself as a custodian of both tangible and intangible heritage linked to local manufacturing culture. From a technical-production perspective, the company's activity today is primarily focused on orthogonal weaving, based on the interlacing of warp and weft. Production is highly specialized in flax (approximately 95% of volumes), while cotton plays a marginal role. The most significant transformations occur upstream and downstream of the core weaving process: in the selection and preparation of raw materials, spinning, finishing, eco-friendly dyeing, and post-production treatments such as packaging, distribution, commercialization, end use, end-of-life management, or integration into circular supply chains.

A central aspect highlighted in the interview concerns production waste. Historically, waste generated from the processing of natural vegetable fibers was considered a resource: it was reused in artisan crafts, destined for domestic applications, or repurposed in collateral supply chains, such as papermaking through fiber maceration. The introduction of stricter waste management regulations in the late 1990s marked, according to the interviewee, a critical turning point: the reclassification of waste as refuse and the restrictions on its commercialization disrupted established circular practices, transforming a potentially valorized material flow into an environmental and economic cost. This paradox becomes particularly evident when considering that such waste is biodegradable, renewable, and compatible with numerous secondary uses. Only recently, with growing public attention to the environmental impacts of the textile industry and the increasing visibility of textile waste, has this issue re-

entered the institutional debate. However, the interview highlights a systemic delay in the ability of waste management policies to recognize the specificities of supply chains based on natural fibers. Circularity appears as part of the company's cultural DNA, yet its concrete implementation encounters structural obstacles. These include the fragmentation of supply chains, which complicates coordination across integrated processes; the difficulty of establishing stable contractual relationships among different actors; and regulatory uncertainty linked to the introduction of Extended Producer Responsibility (EPR) at the European level, which creates operational and governance challenges. Even highly motivated companies struggle to translate circularity principles into effective operational practices. Another key theme concerns international competitiveness. European regulations, rigorous regarding safety, chemical use, and working conditions, guarantee quality and environmental protection but may represent a disadvantage compared to extra-European contexts, where lower regulatory standards reduce costs at the expense of health, safety, and transparency.

This asymmetry highlights the tension between sustainability and market forces, in which the pursuit of lower prices can prevail over the social and environmental impacts of textile products. The transition toward a sustainable textile system also requires changes in consumption practices. Greater awareness of product origin, working conditions, and environmental impacts is essential. In this perspective, circularity is not only an industrial model but a collective responsibility involving producers, policymakers, and consumers. It integrates tradition, technological innovation, and sustainable management of local resources with conscious consumption practices based on product provenance and impact. The experience described in the interview demonstrates that the transition toward a sustainable textile system requires the integration of tradition, technological innovation, circular resource management, and shared responsibility across the value chain. Circularity thus emerges not merely as an industrial strategy, but as a cultural and operational principle linking local heritage, environmental sustainability, and industrial competitiveness.

CASE STUDY: COMPANY B

The interview conducted within a high-end textile manufacturing enterprise operating in a historically consolidated regional district provides a clear and structured view of the main challenges and evolutionary trajectories of the sector, particularly in relation to circularity, supply chain governance, and the strategic role of business networks. A key aspect concerns the establishment of a territorially based textile business network as a response to the structural fragility of micro and small manufacturing enterprises. Unlike traditional consortium models, the analyzed business network, structured through formal network contracts, defines measurable common objectives, mutual commitments, and shared operational tools, functioning as a genuine organizational infrastructure that enables companies to address challenges collectively that a single actor could not face alone. Within this model, the creation of a territorial protection brand is included, supported by a stringent disciplinary code that translates historically consolidated ethical and production principles of the local textile district into operational rules. The code serves a dual purpose: it protects the consumer in terms of quality, traceability, and environmental compliance, and it strengthens the territorial identity of the enterprises, serving as a distinguishing element in the market. The theme of circularity emerges as central yet problematic. The main barriers are neither technological nor cultural, but regulatory. Production residues, such as natural fiber yarn remaining on cones at the end of production, are classified as special waste. This classification prevents storage or reuse, turning a potentially valuable by-product into a management cost and an operational constraint, with the risk of penalties from regulatory authorities. Circularity is therefore effectively blocked, not due to a lack of solutions, but because of the absence of sector-specific regulations capable of recognizing the particularities of small textile enterprises. Alongside regulatory constraints, there is an awareness of the economic limits of micro-enterprises: the investments required to transform waste into resources cannot

burden ordinary operations. In this context, the business network becomes central for creating critical mass, accessing dedicated funding, and distributing investment costs. However, access to public funding is described as complex and disincentivizing, particularly due to onerous reporting procedures, which often consume more resources than they return, contributing to explaining why many opportunities related to the circular transition remain largely theoretical [Fig. 01]. Although recognizing that in the high-end furnishing textile segment the volumes of waste are quantitatively limited, a positive view emerges regarding upcycling practices, such as the reuse of fabrics and samples for traditional handcrafted cultural productions. In this case, waste assumes primarily socio-cultural value, contributing to the reinforcement of territorial identity beyond strictly economic considerations. A critical issue concerns the absence of dedicated units for recovering high-quality yarn at the end of production: despite the intrinsic value of the material and potentially significant volumes at the regional scale, these yarns are sent to landfill because they are classified as waste. The interview thus highlights a systemic contradiction: high-quality materials, safe for end use, are treated as harmful due to regulatory automatism. This represents a potential future opportunity linked to the creation of second-generation supply chains capable of valorizing recovered yarn for alternative applications, thereby reducing landfill disposal.

The discussion on the relationship between craftsmanship and digital technologies highlights a balance between product customization and the integration of digital services. Technology does not replace craftsmanship but supports it, particularly through blockchain tools and NFC systems used to ensure traceability, authenticity, and product storytelling, strengthening the connection between manufacturing, territory,

Fig. 01

and the global market. Artisan knowledge is difficult to transmit quickly and is not always codifiable in line with technological progress. In this context, collaboration with universities and research centers proves strategic both for generational renewal and for innovation management, although it represents an organizational challenge for micro-enterprises. Finally, the business network emerges as a privileged interface for applied research projects, as demonstrated by ongoing experimentation with locally sourced high-quality natural fibers, highlighting the potential of integrated supply chains derived from the reinterpretation of traditional agricultural and production practices.

PROPOSALS AND APPLICATION SCENARIOS IN WELLNESS TEXTILE

TEXTILE PROPOSAL 1: "SMART&SAFE2"

The research project *Smart&Safe2: Design for Smart Inclusive Protection Systems* investigated issues related to prolonged PPE use, with a specific focus on discomfort and adverse skin effects caused by continuous mask wear. The project applied the Adaptive Doing framework throughout the development process.

The *Exploration phase* identified key problems such as dermatological irritation, limited comfort, and inadequate breathability in traditional PPE. Through *Critical reflection*, these findings were examined in relation to material, ergonomic, and environmental requirements, helping define priorities for intervention. During the *Re-conceptualization phase,* these insights informed the development of functional textile concepts and structural configurations, guiding the selection of natural fibers, bio-based components, and additive structures. The *Iterative prototyping phase* involved cycles of CAD development, material testing, and refinement, progressively shaping the solutions presented below.
The project outcomes respond to limitations

Fig. 02

highlighted during the pandemic, proposing advanced protective systems that integrate multifunctionality, inclusivity, and environmental responsibility. The resulting configurations are: *Type A – Multi-material mask with TPU frame*. Nine masks made from natural yarns combined with a biocompatible TPU inner layer and a tri-layer filtering system, balancing protection, comfort, and recyclability; *Type B – Mono-material mask with 3D-printed frame*. Seven masks developed from a single plant-based yarn. A 3D-printed frame with micro-channels allows functional personalization through bioactive compounds, improving breathability, thermal comfort, and dermatological compatibility; Type C – Modular multi-patch system with IoT frame. Mono-material textile patches offering localized protection, integrating controlled-release fillers for targeted skin treatments. An IoT-enabled frame monitors physiological and environmental parameters in real time [Fig. 02].

TEXTILE PROPOSAL 2: "SMART DERMAL WELLNESS SYSTEM FOR PROTECTIVE AND ACTIVE SKIN CARE"

The development of the *Smart dermal Wellness System for protective and active skin care* devices followed the four phases of the Adaptive Doing approach. The *Exploration phase* focused on identifying skin vulnerabilities related to climate-induced stressors, UV exposure, and dehydration. During *Critical reflection*, these findings were compared with emerging opportunities in bio-functionalized textiles and 3D additive structures. The *Re-conceptualization phase* translated these insights into functional concepts integrating plant-based yarns, active delivery mechanisms, and parametric geometries. Through *Iterative prototyping*, the solutions were progressively refined, leading to the consolidated wearable systems described below.

Developed within the Master's Degree in Design for Innovation (Fashion Ecodesign II and Textile Design laboratories), the projects investigate advanced wearable textile systems addressing the impacts of climate change on skin health and human well-being. The proposed devices operate as active textile interfaces with preventive and supportive dermatological functions. Their innovation lies in integrating dermo-active delivery systems directly into the textile structure, transforming fabric from a passive support into a bio-functional medium capable of interacting with the skin and offering alternatives to conventional cosmetic practices.
Dermal Wellness: Protection & Bio-active Absorption [Fig. 03]. This device targets the prevention of UV-related skin damage in the upper chest area. Using a Material-Driven Design approach, it combines plant-based yarns with 3D-printed additive structures featuring functional micro-channels for controlled release of bioactive compounds with screening and antioxidant effects. The modular 3D architecture ensures ergonomics, adaptability, and reduced material waste, supporting sustainable production and use; *Filtrails: Adjuvant Care for Safe and Healthy Skin* [Fig. 04]. Designed for the forearm–wrist area, *Filtrails* supports the treatment of xerosis and dehydration-related skin conditions. It integrates plant-based yarns and 3D structures with micro-channels enabling controlled release of moisturizing and soothing compounds, ensuring continuous protection and skin rebalancing.

DISCUSSION

The evidence emerging from qualitative investigations and design experiments outlines a complex yet opportunity-rich framework for the regeneration of the regional textile sector through Adaptive Doing. The companies interviewed show a strong awareness of sustainability and circularity principles, often deeply rooted in their production history, yet face significant obstacles in their practical implementation. The main challenges identified include: regulatory barriers that hinder the valorization of production waste, particularly natural plant-based fibers that could be reintegrated into circular supply chains; fragmentation of the supply chain, which limits cooperation among actors and makes the adoption of systemic models difficult; limited availability of financial resources for innovation investments, a burden especially heavy for micro and small enterprises; competitive asymmetry compared to extra-European productions subject to fewer regulatory constraints. These elements do not merely represent constraints but reveal structural misalignments between cultural readiness for circularity and the

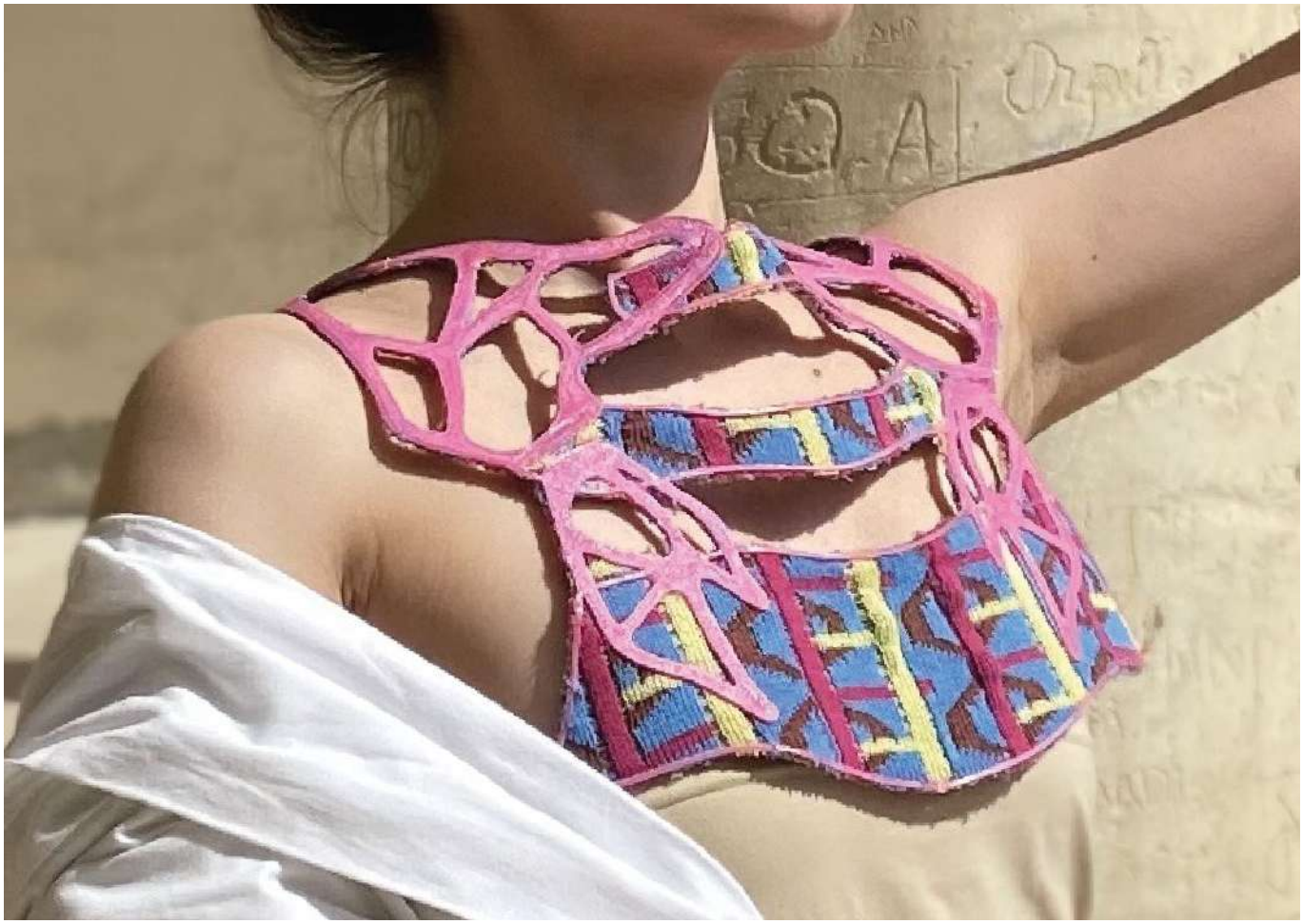

Fig. 03

institutional and market conditions required for its full operationalization. However, these same challenges can be transformed into strengths through the adoption of adaptive strategies. The experience of business networks demonstrates how structured cooperation can generate critical mass, facilitate access to funding, and distribute the costs of innovation.

Moreover, Rethinking Resources enables the valorization not only of material waste but also of local skills, knowledge, and territorial identity, transforming them into strategic assets for market differentiation. In this perspective, circularity emerges not exclusively as a technical objective but as a governance and coordination challenge, requiring alignment between regulatory frameworks, organizational models, and design experimentation. The Textile Design experiments presented highlight how the integration of natural materials, additive technologies, and bioactive compounds can configure new local textile economies within the wellness segment. These developments require: upgrading existing facilities to integrate 3D printing and material functionalization technologies; diversification of raw materials, favouring local plant-based fibers and valorized by-products; development of multidisciplinary skills through collaboration with universities and research centres; creation of second-generation supply chains capable of transforming by-products into new value opportunities. *Wellness Textiles* emerge as a strategic application area for combining manufacturing tradition, technological innovation, and responses to emerging health and well-being needs. The Adaptive Doing approach allows for the management of market and technological uncertainty through iterative cycles of experimentation, learning, and adaptation, supporting a gradual but structural transition toward regenerative production models. The discussion, therefore, confirms that Adaptive Doing operates not only as a project methodology

Fig. 04

but as a systemic capability for territorial adaptation, enabling continuous recalibration between empirical evidence, design response, and production feasibility. Collaboration among companies, universities, and public institutions proves essential to building territorial innovation ecosystems capable of generating shared environmental, social, and economic benefits.

CONCLUSIONS

This contribution reflects, from a dual critical and design-practice perspective, on the application of Adaptive Doing as a design paradigm for the regeneration of the local textile sector, with particular reference to the Wellness Textile segment. Through the integration of qualitative investigations and design experiments, the research has demonstrated how the adaptive approach can translate contemporary sustainability and circularity challenges into concrete opportunities for territorial innovation. The analysis of production realities highlighted a wealth of skills, manufacturing traditions, and environmental awareness, which constitute a solid foundation for transformative processes. However, the full realization of circular and regenerative potential requires overcoming regulatory barriers that hinder the valorization of waste, promoting structured forms of cooperation between companies, and facilitating access to innovation resources. The textile experiments developed demonstrate the technical feasibility and practical relevance of bio-functionalized textile systems for well-being, integrating natural materials, additive technologies, and bioactive compounds into solutions that combine performance, sustainability, and personalization.

These outcomes confirm that design experimentation can function simultaneously as a research method and as a strategic anticipatory tool, capable of visualizing and testing future production scenarios before large-scale industrial implementation. These results outline innovative production scenarios that can strengthen the

competitiveness of local manufacturing through qualitative differentiation and access to high-value-added markets.

Adaptive Doing is confirmed as an effective methodological approach for navigating complexity and addressing uncertainty in contemporary production systems, aspiring to continuous learning, controlled experimentation, and proactive adaptation to ongoing transformations. The principle of Rethinking Resources, integrated into this perspective, allows for the systemic valorization not only of primary and secondary raw materials but also of human capital, local knowledge, and existing infrastructure, transforming them into levers for territorial regeneration. In this sense, the research contributes to repositioning circularity from a compliance-driven obligation to a strategic driver of innovation and resilience within localized manufacturing ecosystems.

Future research perspectives include extending the investigation to a larger sample of production realities, experimenting with circular business models supported by digital traceability tools, and quantitatively evaluating the environmental and economic impacts of the proposed solutions through LCA methodologies.

Strengthening ultra-territorial networks of collaboration between research, industry, and institutions also represents a priority for translating research results into strategic industrial policies and tools to support the twin transitions. In conclusion, the RHITA project and the Adaptive Doing approach demonstrate how the valorization of Made in Italy textiles can be based on a conscious synthesis of manufacturing heritage preservation, technological innovation, and environmental and social responsibility, generating resilient, inclusive territorial development models oriented toward shared well-being. Adaptive Doing thus emerges not as a prescriptive framework but as a dynamic and iterative capability, enabling territories to reinterpret resources, manage disruption continuously, and progressively align sustainability ambitions with operational realities.

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DECLARATION ON ORIGINALITY AND USE OF GENERATIVE AI

AI-based tools were employed exclusively to improve grammar, syntax, and linguistic consistency across the manuscript. All conceptual, methodological, analytical, and interpretative content was fully developed by the authors.

CAPTIONS

[Fig. 01]. Silk waste on an industrial loom, reusable textile processing by-products. Silk manufacturing company, sample n°2. Source: authors' elaboration (2024).

[Fig. 02]. Type B shooting referring to mono-material mask with 3D frame and customizable PPE. Smart&Safe2: Design for Smart Inclusive Protection Systems project. Source: authors' elaboration (2024).

[Fig. 03]. Wearable device engineered to prevent UV-induced skin damage, designed to combine protective and bioactive functions for optimized dermal wellness. Source: authors' elaboration (2025).

[Fig. 04]. Prototyping phase of Filtrails: a multi-material device in organic cotton with 3D microchannel structures, engineered for the controlled release of hydrating and soothing bio-actives. Source: authors' elaboration (2025).

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UNDERSTANDING FASHION CONSUMPTION BETWEEN SUSTAINABLE INTENTIONS AND ACTUAL BEHAVIOUR

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Abstract

The article explores and discusses how fashion consumers interpret sustainability today, highlighting the gap that often exists between stated intentions and actual purchasing behaviour. Through a participatory workshop, the research reconstructs the attitudes, motivations, and obstacles that influence daily choices regarding fashion products. The activities carried out (based on scenarios, narratives, and visual tools) made it possible to outline a series of archetypes that represent both current practices and aspirations towards more responsible models, focused on transparency, quality, and circularity. The results offer useful insights for small and medium-sized enterprises to better understand new consumer profiles and orient strategies, communication and services towards greater sustainability and inclusion.

Keywords: *Fashion Consumption, Co-Design, Sustainability, Intention–Action Gap, User Insights*

INTRODUCTION

The global fashion industry is characterised by elevated levels of production and consumption, shaped by a predominantly linear *take-make-dispose* model (Battisti & Spennato, 2024).
In response to the environmental and social degradation inherent in this paradigm, the European Union's Circular Economy (CE) Agenda has introduced rigorous regulatory frameworks, including Extended Producer Responsibility (EPR) and the Digital Product Passport (DPP), designed to enforce corporate accountability across the product lifecycle (European Parliament & Council, 2024). Central to this policy-driven transition is the promotion of Collaborative Fashion Consumption (CFC). By encompassing practices such as resale, rental, and swapping, CFC reconfigures the consumer-product relationship, prioritizing access over ownership to extend garment lifespans (Arrigo, 2021; Becker-Leifhold & Iran, 2018; Iran & Schrader, 2017).
Theoretically, these alternative models are rooted in Product-Service Systems (PSS), which aim to decouple economic growth from resource usage (Tukker, 2015; Vezzoli, 2017). However, the practical efficacy of CFC is frequently undermined by the *intention-action gap*: a persistent discrepancy between consumers stated environmental values and their actual purchasing behaviours (Park & Joyner Armstrong, 2019) .This gap is sustained by the continued dominance of price sensitivity, convenience, and entrenched consumption routines

(Singh & Giacosa, 2019). This study defends that for collaborative models to achieve meaningful impact they must evolve beyond transactional service offerings toward community-driven systems. In these *social-collaborative loops* consumers function as active co-creators rather than passive end-users (Fehrer & Wieland, 2021).

However, while large-scale corporations can leverage economies of scale to absorb the high operational and compliance costs associated with CFC models, DPP and EPR, Small and Medium-sized Enterprises (SMEs) often find themselves at a disadvantage (Neri et al., 2023). For many smaller brands, the technological and logistical requirements of circularity represent significant barriers to entry rather than opportunities for growth. Furthermore, the market dominance of major fast-fashion players (Eric, 2014), who are now entering the resale and rental spaces, can marginalize independent circular businesses that lack the marketing capital to compete. In the absence of tailored strategic frameworks, SMEs may encounter challenges in adapting to regulatory contexts that are more readily navigated by organizations with greater infrastructural capacity to operationalize sustainability.

This paper presents a participatory workshop that functions as a behavioural mapping tool for fashion consumption. By translating qualitative and quantitative data into six future-oriented archetypes, the study assesses consumer intentions and practical capability regarding Collaborative Fashion Consumption (CFC) and Sustainable Product-Service Systems (S.PSS). These archetypes provide a diagnostic framework for SMEs to develop retail strategies based on observed behavioural drivers rather than standard sustainability assumptions. This endeavour is part of the PRIN 2022 PNRR 'RHITA' project, where the author serves as a junior researcher.

SYSTEMIC CRISES, REGULATORY DRIVERS, AND BEHAVIOURAL BARRIERS: A BRIEF CONCEPTUAL BACKGROUND

The global fashion industry remains dominated by an unsustainable linear *take-make-dispose* model that has driven systemic overproduction and overconsumption (Saccani et al., 2023). The widespread fast fashion phenomenon, marked by rapid trend cycles and low-cost production, has attracted considerable scholarly interest due to its environmental and social consequences, which often contribute to global ecological imbalances and socioeconomic inequalities (Battisti & Spennato, 2024; Bick et al., 2018; Brewer, 2019). Within this context, regulatory intervention has emerged as a key driver of systemic change, particularly through the European Union's Circular Economy Agenda (European Commission, 2022). Central to this framework is Extended Producer Responsibility (EPR), which reallocates financial and operational responsibility for end-of-life management from municipalities to producers. By extending accountability across the product life cycle, EPR incentivises brands to prioritise durability, repairability, and recyclability at the design stage (Carlsson et al., 2021). Complementing this measure, the Digital Product Passport (DPP), mandated under the Ecodesign for Sustainable Products Regulation (ESPR), provides transparent and verifiable data on product composition, origin, and end-of-life pathways via digital identifiers such as QR codes(Garcia-Torres et al., 2022). Additional regulations, including the ban on the incineration of unsold fashion goods, further compel brands to adopt circular strategies such as donation and resale, collectively reducing opportunities for greenwashing and reinforcing industry-wide transparency.

Within this regulatory context, Collaborative Fashion Consumption (CFC) has gained prominence as a mechanism to counter linear consumption by privileging access over ownership (Akbar & Hoffmann, 2023; Arekrans et al., 2022; Arrigo, 2021). Practices such as swapping, renting, leasing, and reselling seek to extend garment lifespans and decelerate consumption cycles (Gopalakrishnan & Matthews, 2018; Jain et al., 2022). These models are conceptually grounded in Product-Service Systems (PSS), which integrate products and services to fulfil user needs (Goedkoop et al., 1999). However, existing research indicates that PSS models do not inherently produce sustainability outcomes unless they are explicitly aligned with Circular Economy principles (Tukker, 2004). In their absence, service-based models may generate only incremental environmental benefits. The shift toward Sustainable Product-Service Systems (S.PSS) therefore aims to align value creation with resource efficiency across environmental, economic, and social dimensions (Vezzoli et al., 2022). Despite their potential, the effectiveness of CFC and

S.PSS remains constrained by the *intention-action gap* (Camacho-Otero et al., 2019; Catulli et al., 2013). While consumers frequently express pro-environmental values, actual participation in collaborative models is more strongly driven by economic and hedonic motivations, including cost savings and novelty (Lang & Armstrong, 2018; Tunn et al., 2021)which include sale of redesigned clothing, clothing repair/alteration service, clothing renting, clothing swapping and style consultancy service. Design/methodology/approach: The present study examined the causal relationship between fashion leadership and intentions to engage in CPSS. By applying the theory of planned behavior (TPB. At the point of purchase, factors such as price, convenience, and habitual behaviour tend to outweigh ethical considerations (Won & Kim, 2020).
To analyse this gap, research often employs the Theory of Planned Behaviour (TPB), which attributes behavioural intention to attitudes, subjective norms, and perceived behavioural control (Ajzen, 1991). In S.PSS contexts, sustainable attitudes often fail to produce action when social standards favouring ownership or limited infrastructure for rental and repair act as barriers. Consequently, despite favourable intentions, these constraints restrict a consumer's practical capability to engage in Collaborative Fashion Consumption (CFC).

This misalignment can result in rebound effects, whereby practices such as resale facilitate further consumption, thereby reinforcing overproduction (Munten et al., 2024). Overcoming these limitations requires a shift from awareness-based strategies toward the design of systems that account for behavioural biases while making sustainable practices competitively desirable and accessible. Simultaneously, the retail landscape is evolving toward community-driven consumption models that challenge traditional transactional structures (Akbar & Hoffmann, 2023). In these participatory ecosystems, consumers act as co-creators of value, assuming roles traditionally held by retailers, including authentication, pricing, and logistical coordination (Fehrer & Wieland, 2021; Roussat et al., 2023). Evidence links community engagement to better sustainability. P2P models often outperform B2C frameworks environmentally (Philip et al., 2015). Mobilizing active consumers fosters emotional durability and shared value during sustainability transitions.

METHODOLOGY

This paper presents an integrated qualitative and quantitative research approach aimed at developing a refined understanding of contemporary consumer profiles within the fashion industry. Qualitative insights were generated through a participatory workshop, in which fashion consumers explored their attitudes, behaviours, and expectations toward Collaborative Fashion Consumption (CFC) services. These participatory methods were employed to identify adoption barriers and motivations within collaborative consumption contexts and to facilitate co-creation and stakeholder engagement, in line with established participatory design principles (Muratovski et al., 2022).
Data collected from these activities (including field notes, photographic documentation, and participant-produced materials) were systematically analysed to reveal patterns of behaviour, motivation, and engagement. Ethical procedures followed institutional and academic requirements, participants provided informed consent and were informed of their rights, including confidentiality and withdrawal. Full interview transcriptions are securely stored and available on request, ensuring participant privacy.

These qualitative findings informed the development of preliminary consumer archetypes, which were subsequently refined and validated through a structured quantitative survey. While general models such as the Sinus-Milieu (SINUS Markt- und Sozialforschung GmbH, 2023) provide broad lifestyle context, they may lack the specific detail needed to address the *intention-action gap* within circular fashion. The fashion-specific archetypes proposed here differentiate consumers based on distinct intentions and practical capability, variables that general milieus often conflate. The synthesis of participatory workshop outcomes and survey data resulted in the identification of six future-oriented consumer archetypes. These archetypes function as a critical and practical interpretative framework for understanding consumer motivations, expectations, and the persistent challenges associated with engagement in CFC services.
The study was conducted in two linked phases.

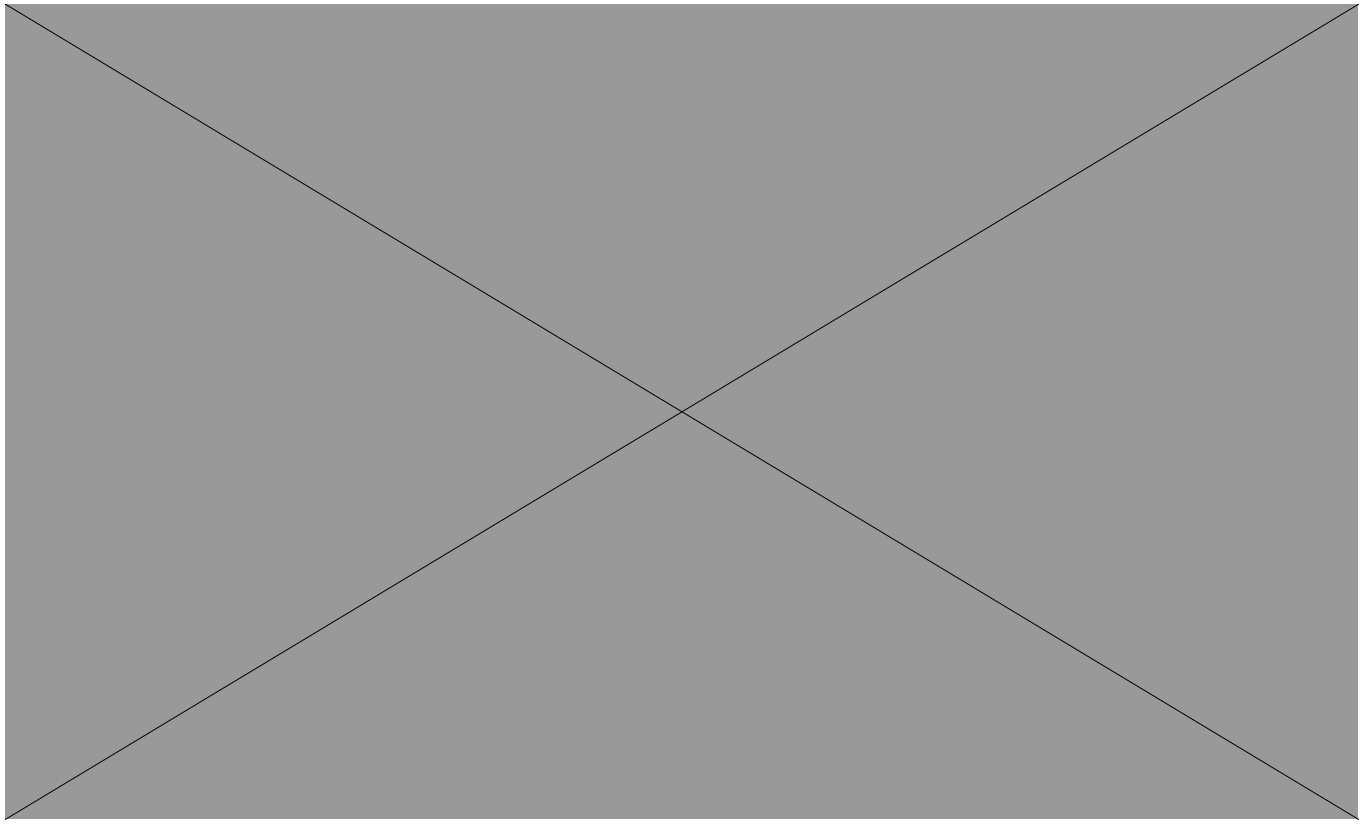

Fig. 01

In the initial qualitative phase, the study utilized a Research Through Design (RtD) framework to engage a group of nine consumers in a participatory workshop (Muratovski et al., 2022). These participants, drawn from professional backgrounds in fashion, design, and the arts, were chosen for their high literacy in circularity discourse, which allowed the research to probe deeply into the psychological friction points where professional ideals meet personal consumption routines.
Through a three-hour session of generative mapping and visual elicitation, participants visualized their own wardrobe lifecycles, this process served to externalize implicit behavioural patterns and provided the foundation for a series of draft consumer profiles.
The second phase sought to validate and refine these emerging profiles through a quantitative survey distributed to a broader demographic of 100 fashion consumers. This stage was essential for ensuring that the insights harvested from the specialist group possessed wider market relevance. The survey instrument evaluated participants on a multi-dimensional scale, measuring the gap between their stated ethical intentions and their actual participation in collaborative practices, such as rental, subscription, and resale, over the preceding year. By subjecting this data to cluster analysis, the research was able to synthesize the findings from both phases into a final framework of six future-oriented consumer archetypes, balancing the deep human narrative of the workshop with the empirical weight of quantitative data (Creswell & Creswell, 2018).

PHASE 1: QUALITATIVE EXPLORATION THROUGH A PARTICIPATORY WORKSHOP

The initial phase, conducted in May 2025, featured an interactive, collaborative workshop generating tangible consumer observations. This iterative process enabled participants to introspect on personal habits while increasing awareness of sustainable fashion contexts.
The workshop was structured around three core objectives:

- To construct future-oriented consumer archetypes that address the *intention-action gap* prevalent in sustainable fashion

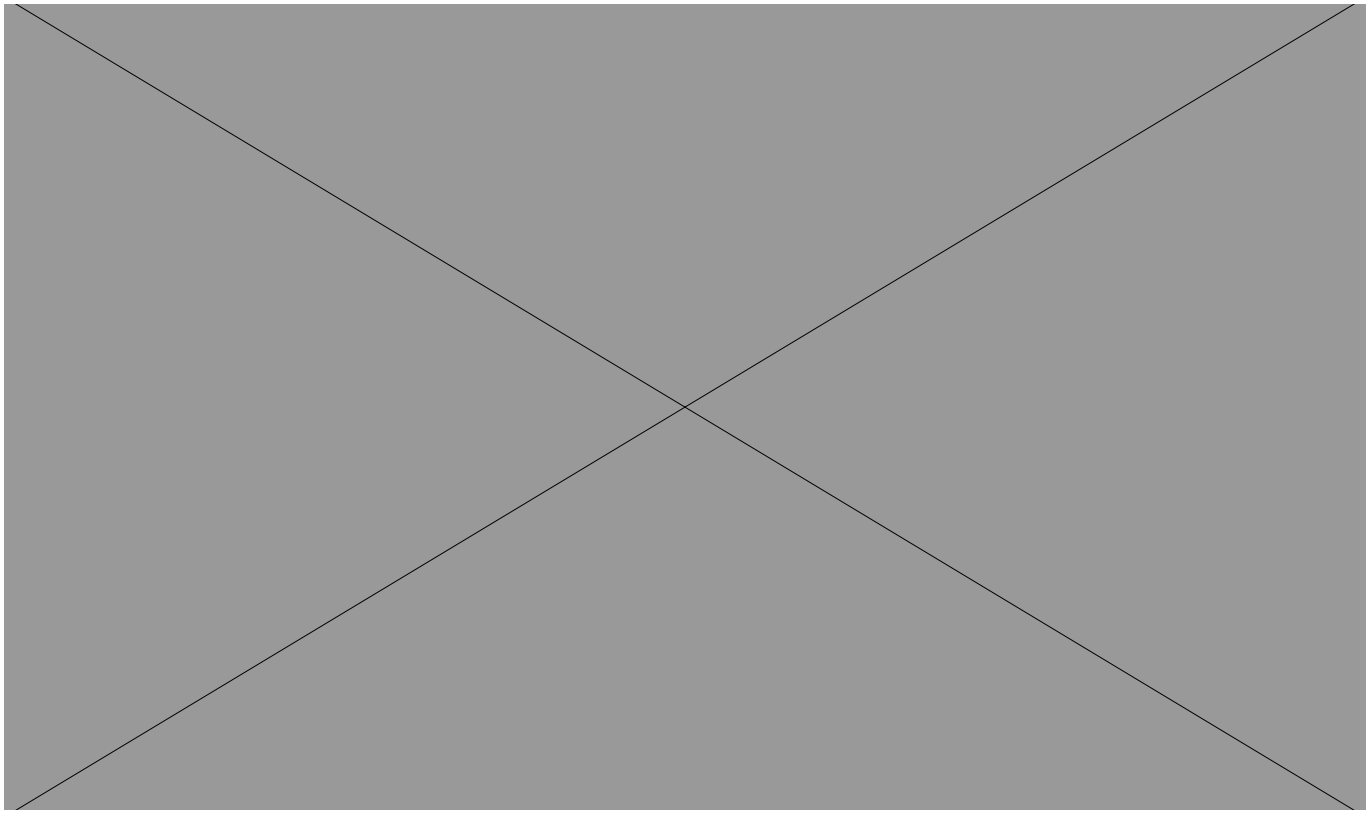

Fig. 02

consumption, thereby creating profiles that are more predictive than merely descriptive.
- To establish a foundation for practical guidelines to support not only well stablished fashion services, but also SMEs in redesigning their retail strategies, ensuring that these strategies are responsive to actual consumer needs and behaviours.
- To enhance consumer awareness of collaborative and alternative retail models, both locally and globally, by directly exposing them to different business models and encouraging critical reflection.

The session was divided into two broad sections [Fig. 01]. The initial, ***Personal Consumption Mapping***, involved participants filling out a scenario-based card exercise and visual mapping tool to describe their consumption patterns across three categories: "What I Do" (current habits), "What I Don't Do" (things they don't currently do), and "What I Would Like to Do" (things they wish to do in the future). This activity was not only meant to provoke individual contemplation but also facilitate peer-to-peer discussion since the discussions among participants elicited shared challenges and aspirations. However, participants maintained full agency over the distribution of these cards; there were no mandatory quotas or required balances across the three categories. Using the support cards, the researcher guided participants through the 12 rows of Board 1, with each row representing a different hypothetical scenario (e.g., "Your wardrobe is overflowing with clothes, and you don't wear them all. What do you do about it?"). Each card included a pre-designed response, such as "I pass them on to someone I'm sure will use them (e.g., a friend or family member).". These cards were used to visually express their individual consumption behaviours by placing them along three designated columns labelled: "WHAT I DO," "WHAT I DON'T DO," and "WHAT I WOULD LIKE TO DO."

The triangular cards are also colour-coded to distinguish each and every one of the twelve rows, with each group having a unique colour [Fig. 02]. The three triangles within each group are distinguished through varying levels of transparency (25%, 50%, and 100%) that signify

a spectrum of sustainability. The highest level of opacity triangles signifies very sustainable practices, the low-level transparency for less sustainable options, and the middle level of transparency for intermediate practices. By the end of the exercise, each participant has Board 1 as a personalized graphical map of their own fashion consumption habits. Both self- and comparative analysis of sustainable behaviour across the group are supported by this visualization.

The second part of the activity, ***Sustainable Landscape Exploration***, was designed to enhance participants' understanding of small and medium-sized enterprises (SMEs) operating in the sustainable fashion sector. By spotlighting lesser-known initiatives, it encourages critical engagement with alternative retail models and their connections to mainstream industry practices.
Participants start by going through a deck of support cards, each one presenting an SME that is either well known or not so well known, i.e.: Rifò, Tulerie, Loom, Older, Armorie, ThreadUp, depop, Sustainably Chic, Nicoletta Fasani, Worn Wear, Cotopaxi, Drexcode. The cards summarize the SME's service model, main values, and field of operation. Based on this information, players are asked to position each card in the most suitable spot on a pre-structured board. It is structured by category, type of service, or defining feature and incorporates other existing fashion brands as a point of reference. By doing this, the participants are able to conceptually anchor potential future SMEs in relation to current market actors, creating a more cohesive vision of the pluralistic field of sustainable fashion services.

Once the cards have been positioned, participants are asked to select a service they would consider using and place a post it notes within the corresponding category. On the post it, they are invited to share their reflections, such as their reasons for choosing the service, any reservations about its appeal or accessibility, or suggestions for improvement. By prompting this critical reflection, the activity not only educates participants about sustainable fashion alternatives but also empowers them to consider their role as consumers in shaping a more equitable and circular fashion system.
Due to word count constraints, a detailed account of each board, support card, and the corresponding survey of participant interactions cannot be provided. The description focuses on the key elements and outcomes most relevant to the study's objectives.

FINDINGS

The workshop group consisted of nine participants [Tab. 01] with a focus on design, fashion, and the arts, bringing a range of academic and professionals backgrounds to the discussion. This diverse composition was instrumental in generating a spectrum of perspectives. Analysis of the workshop revealed a significant overlap in participant behaviours and aspirations, particularly highlighting a persistent gap between their sustainable intentions and their actual purchasing practices. This gap was a central theme throughout the findings.

PART 1 - PERSONAL CONSUMPTION MAPPING FINDINGS

Seven of the nine participants demonstrated a common core consumption profile, marked by behavioural patterns that are not overtly unsustainable yet reveal inconsistencies between expressed commitments and enacted practices, as outlined below.
Reactive Wardrobe Management: A recurring theme was the struggle with overflowing closets or garments requiring minor repairs. Participants often viewed these issues as *"inevitable burdens"* or future chores, leading to a physical accumulation of items. This passive approach directly contradicts their stated desire for a more intentional and organized relationship with their clothing.
Aspirational Circularity: Participants admitted to letting unused or damaged items sit idle in storage, despite expressing a strong drive to participate in the circular economy. While they recognized the ideal actions, such as donating, reselling, or organizing, their reality often involved holding onto poorly fitting online purchases. This gap between the intent to return items and the failure to do so within a timeframe highlights a significant intention-action discrepancy.

Price Over Ethics: Sustainable intentions were frequently overridden by financial considerations. Participants admitted to purchasing from regions with poor labour standards and choosing low-cost materials like polyester blends. Although they expressed a future desire to avoid such practices, current purchasing decisions remain dominated by budget constraints rather than ethical values.

Participant	Consumption Profile Summary
Participant 1 (P1) Fashion Design Student (Gen Z Female)	Wardrobe management is reactive; would like to donate/resell/re-use. Buys cheap regardless of material but avoids polyester where possible. Documentaries concern her but shopping behaviour doesn't change; will attempt to buy fewer sustainable brands. Certification is not influential but would like it to be. Seasonal versatile buying. Leisure: eco/second hand swimwear only. Social events: re-styling/borrowing.
Participant 2 (P2) Fashion Design Student (Gen Z Female)	Leaves issues with clothes/defects unaddressed. Hopes to donate/re-sell/re-purpose. Rarely returns but would like immediate returns. Wants price-driven buys; does not want polyester. Documentaries bother her but does not change a habit; hopes to purchase less sustainable brands. Does not get influenced by certifications but hopes to. Seasonal versatile consumption. Recreational: eco/second-hand swimsuits. Social gatherings: re-style/borrow.
Participant 3 (P3) Fashion Design Student (Gen Z Female)	Leaves closet issues untouched. Hopes to donate/sell/repurpose. Not influenced by certifications but would like to give priority to certified brands. Budget: timeless, good-quality items. Seasonal cross-seasonal shopping. Recreation: eco/second-hand swimwear. Social events: refashion/borrow.
Participant 4 (P4) Industrial Designer Researcher	Alternative ethical stance: no moral issue with sweatshop countries. Chooses cheapest T-shirts without regard to fabric. Does not believe certifications (considers greenwash). Shaken by documentaries but lifestyle unaffected. Seasonal adaptive buying. Price point: timeless, durable items. Recreation: green/hand-me-down swim wear. Social events: upcycle/borrow.
Participant 5 (P5) PhD Student in Design (Millennial Female)	Would not buy from poverty labour countries. Chooses cheapest regardless of material. Upset by documentaries; habits haven't changed but wants to sustainable alternatives. Not influenced by certifications but wants to. Seasonal versatile shopping. Budget: classic, good-quality pieces. Leisure: eco/second hand swimwear. Social: restyle/borrow.
Participant 6 (P6) PhD Student in Design (Millennial Male)	Wardrobe abandonment. Hopes to donate/re-sell/re-purpose. Buys cheap T-shirts; does not want polyester. Disturbed by documentaries; looks for sustainable brands. Not influenced by certifications but wishes to be. Seasonal versatile buying. Budget: classic, quality. Recreation: eco/second hand swimwear. Social events: restyle/borrow.
Participant 7 (P7) Musician (Millennial Female)	Forgets about wardrobe. Aims to donate/re-sell/re-use. Bases shopping on price, would not like to purchase polyester. Alarmed by documentaries but no habit change. Not influenced by labels but wishes to be. Seasonal all-around buys. Budget: quality, classic items. Leisure: second-hand/eco swimwear. Social events: restyle/borrow
Participant 8 (P8) Fashion Design Student (Gen Z Female)	Forgets about wardrobe. Aspires to donate/resell/re-purpose. Buys low-price regardless of material; polyester is avoided. Documentaries annoy her but routine continues as is. Not influenced by credentials but aspires to give preference to credentialed brands. Seasonal versatile buying. Budget: timeless, quality. Leisure: eco/second-hand swimsuits. Social events: re-make/borrow.
Participant 9 (P9) Fashion Design Student/Photographer (Gen Z Female)	Wardrobe indifference. Aspires to donate/re-sell/re-use. Buys inexpensive T-shirts but dislikes polyester. Documentaries annoy her but no change in behaviour. Not influenced by certifications but aspires to be. Seasonal flexible buying. Budget: timeless, quality. Recreation: specifically, would just prefer to keep using current swimwear. Social events: re-style/borrow.

Tab. 01

Awareness and Action: While participants noted that documentaries on the fashion industry's environmental and social costs caused them discomfort, this increased awareness rarely led to behavioural shifts. The goal to *"buy less and choose sustainable brands"* remains a conceptual ideal rather than a practical habit, failing to trigger meaningful changes in consumption patterns.
Scepticism of Certifications: At present, sustainability certifications do not influence purchasing habits. This is attributed to either a lack of awareness or a general distrust of the authenticity of such labels. However, participants indicated a future preference for certified brands, suggesting a latent desire for visible and trustworthy indicators of sustainability.

PART 2 - SUSTAINABLE LANDSCAPE EXPLORATION FINDINGS

During this phase, other than the actions already described in section 4, participants were asked to self-identify into four preliminary archetype categories: Zero Wasters, Renters, Researchers, or Resellers [Tab. 02]. This exercise served for identifying broader patterns of behaviour. An analysis of the workshop data showed that most participants aligned with these archetypes, though two did not fit neatly into any of the initial categories, a significant finding:

- Zero Wasters: The members of this group were highly aware and very critical of

Participant	Archetype	Awareness	Consumer Consulting	Affiliated Brands
P1	Reseller	Moderate	Interested in resale/repair services	Vinted, Depop
P2	Reseller	Moderate	Would use second-hand platforms	Vinted, eBay
P3	Reseller	Moderate	Sees resale as sustainable option	Depop, Vestiaire Collective
P4	Zero Waster	High	Skeptical of certifications, but open to zero-waste	Patagonia
P5	Zero Waster	High	Would engage with recycling/upcycling services	Eileen Fisher Renew
P6	Zero Waster	High	Open to sustainable services but cautious	Patagonia, Veja
P7	Researcher	Very high	Curious about ethical research-oriented brands	Good On You
P8	Not aligned	Varied	Struggles to connect with services	Fast fashion + mix
P9	Not aligned	Varied	No clear archetype alignment	Mixed brands

Tab. 02

certifications and appreciated brands with a zero-waste ideology.

- Resellers: These members were moderately aware of the sustainable environment and participated in reselling and repairing clothes platforms and services.

- Researchers: This character was characterized by extremely heightened consciousness and strong research-driven, ethical brand interest, seeking open information on production and sourcing.

- Unaligned Participants: The identification of two "Unaligned" participants (those disconnected from provided brands and services) highlights consumer behaviour complexities exceeding initial categorizations. This finding necessitates broader future studies to further chart and validate these understandings.

PHASE 2: QUANTITATIVE VALIDATION AND ARCHETYPE REFINEMENT

The preliminary participatory workshop established a baseline understanding of consumer behaviours. To build upon this and develop future-oriented consumer archetypes, a quantitative survey was developed. This survey adapted the 12 hypothetical scenarios from the workshop's first board to validate qualitative insights with a broader demographic and secure structured data.
Titled "The Future of Fashion Consumption", the survey was administered via Microsoft Teams using a convenience sampling approach throughout June and July of 2025, resulting in 100 responses with an average completion time of 10 minutes and 34 seconds. Data collection was finalized once the 100-response target was reached. The questionnaire was intended to quantitatively verify and expand on the workshop's findings, using an iterative design process. By applying the same 12 scenarios to a larger group, the survey helped refine the final consumer archetypes. The questionnaire consisted of 19 questions targeting purchasing habits, consumer values, and situational behavioural responses presented as multiple-choice options where respondents selected the specific action or value that best aligned with their personal habits. Mirroring the workshop logic, respondents were asked to categorize their responses to the

12 scenarios without a mandatory requirement for balanced distribution among categories. Full survey questions and data results are available upon request.

FINDINGS

The examination of 100 anonymised survey data from respondents reveals an often-contradictory picture of contemporary fashion consumption. The findings create a consumer market which is pragmatically minded in overall spending tendencies but also is highly ethical and with a strong desire for more circular and conscious practices.

The sample is composed primarily young European women. The demographic is younger generation skewed with 68 reporting themselves as Generation Z and 31 as Millennials. The geography is 93 participants located in Europe. The gender divide is also present, with 74 responding as women, 23 as men, two as non-binary, one as preferring not to say. This specific demographic segment also showed moderate consumption levels; the most common frequency of purchases is "every few months" (56 respondents), while the majority of the segment (54 respondents) spends less than €500 annually on clothing.

Analysis of the primary shopping decision drivers shows high pragmatic pull. Upon being asked to rank various factors on a five-to-one scale, tangible attributes like quality and price are the obvious victors. The new two respondents added to this iteration only tend to reinforce this trend further, both giving quality a 5 out of 5 and price 4 and 3, respectively. Across the entire sample, these practical considerations overshadow more abstract values. Ethical and environmental factors, while recorded, were rated as far less important, with "Ethical Production" and "Environmental Impact" rated lower on average. "Style/Trends" was also rated lower as an importance. This rating implies consumers in normal shopping conditions prioritize individual benefit, for instance, price and durability, above broader social or environmental aims.

However, a more nuanced image is painted by the scenario-based questions in the survey that distinguish between wanted and enacted behaviour ("That's what I do" versus "That's what I would like to do"). The comparison illustrates a wide gap between aspiration and behaviour. The strongest ethical stance was witnessed in response to the child labour situation; 86 stated that they already "refuse to buy that garment", and introducing the new data adds one more person who "would like to do" that too, totalling 14. This near universal response suggests that when an ethical issue is stringent and unequivocal, it will have the ability to override other considerations while shopping.

Similarly, the respondents strongly preferred circular fashion practices. Of the entire dataset, 79 already donate or sell off unwanted clothes, and 20 others are willing to. To repair defects, 63 already do so, while 35 others want to, reflecting an extremely low willingness to discard faulty clothing. The preference is towards reuse, as 59 of the sample expressed that they would buy a timeless design for a special event on which they can wear it again, while only 15 would buy a fashionable dress for once-off usage.

Aspirational gap is greatest when eco-friendly options require greater efforts or expenses. Though just 30 of the respondents currently consider buying from sustainable certification brands a priority, 59 indicated they "would like to do" so. The most common group of respondents (64) fall into a middle category, reporting labels will trigger a purchase but that price and fashion continue to be more important. When prices rise, the optimal reaction is not trade down but trade up in terms of quality and longevity. 62 of the interviewees intend to "purchase fewer things and focus only on traditional, high-quality items" an increase of 34 from those who do so at present.

Across the board, the full sample of 100 responses supports the preliminary findings. It portrays a consumer dominated by a salient contradiction. Their overall purchasing pattern is governed by the self-interested and utilitarian concerns with price and quality. But when faced with real-life ethical or environmental scenarios, they profess a strong feeling of obligation to act as responsible consumers and an earnest desire to get out of their habits. The repeated gap between intended and actual behaviour shows an unrealized desire for easy and appealing sustainable clothing, proclaiming once more that consumers are actually seeking means of aligning their consumption with their ethical aspirations.

By merging the qualitative knowledge gained from the workshop with the quantitative controlled data from the survey, six final future-oriented consumer archetypes were constructed.

CONSTRUCTION OF THE ARCHETYPES

The concept of archetypes originates in Carl Gustav Jung's analytical psychology, where archetypes are understood as universal and innate patterns embedded in the collective unconscious, shaping shared myths, symbols, and narratives across cultures (Jung, 1968). These ideas were later adapted to branding and marketing by Carol S. Pearson and Margaret Mark, who, in *The Hero and the Outlaw* (2001), codified twelve archetypes into a practical framework for defining brand personality and fostering emotional connections with consumers. While informed by these theoretical and strategic foundations, this study develops its own archetypes through an empirically grounded analytical framework rather than adopting existing models. The six consumer archetypes were developed through a structured mixed-methods process combining qualitative exploration with quantitative validation. This approach aimed to produce empirically grounded and practically applicable archetypes capable of capturing contemporary fashion consumption behaviours. The first phase consisted of an exploratory participatory workshop using a Personal Consumption Mapping exercise based on twelve hypothetical fashion consumption scenarios. Participants visually mapped their current and aspirational practices, revealing a persistent *intention-action gap*. Sustainable behaviours, such as repairing, reselling, or passing on garments, were frequently positioned as desired rather than enacted practices. Preliminary analysis identified initial consumer categories (e.g., Reseller, Zero Waster, Researcher); however, a part of participants did not align clearly with these profiles, indicating the need for a more nuanced classification system. In the second phase, a quantitative survey (The Future of Fashion Consumption) was administered to 100 participants adapting the dynamic applied in the workshop. The results confirmed the qualitative findings, particularly the dominance of utilitarian drivers such as price and quality over

ARCHETYPE	VALUES	TYPICAL BEHAVIOURS
The Conscious Minimalist	Sustainability Long-term Thinking Quality over Quantity	▪ Buys fewer items, chooses timeless and versatile pieces ▪ Waits for sales or chooses mid-range ethical brands ▪ Repairs, repurposes, or donates old clothing ▪ Avoids polyester, prioritizes cotton or sustainable fibres ▪ Responds to climate concerns by reducing new purchases
The Aspiring Circularist	Responsibility Practicality Low-waste Lifestyle	▪ Wants to do the right thing but doesn't always follow through ▪ Leaves clothes unused but aspires to donate or upcycle them ▪ Influenced by sustainable certifications, but price and style still matter ▪ Interested in services like repair, resale, and recycling
The Cost-Conscious Pragmatist	Affordability Utility Accessibility	▪ Chooses cheaper garments regardless of sustainability credentials ▪ Buys seasonal or trendy items for short-term use ▪ Returns or discards items easily if they don't meet expectations ▪ Feels bad about unsustainable choices but prioritizes financial constraints
The Style-Driven Shopper	Appearance Self-expression Social relevance	▪ Buys trendy items for events or social expectations ▪ May recognize sustainability but prioritizes look and fashion value ▪ Returns unwanted items quickly and moves on ▪ Occasionally buys high-quality or timeless pieces when style aligns
The Diy Upcycler	Creativity Self-sufficiency Sustainability	▪ Repairs or alters clothes independently ▪ Repurposes old clothes into cleaning rags, bags, etc. ▪ Buys 100% cotton or avoids polyester intentionally ▪ Generally skeptical of greenwashing or vague certifications
The Ethical Researcher	Transparency Ethics Awareness	▪ Refuses to buy from brands linked to poor labor conditions ▪ Prioritizes certified sustainable brands ▪ Investigates the credibility of certifications ▪ Openly questions marketing claims and corporate responsibility

Tab. 03

broader environmental aspirations. While ethical concerns were generally secondary, specific issues, most notably child labour, emerged as consistently prioritised. Cluster analysis further demonstrated high engagement with reuse behaviours, such as repairing garments and reselling or passing on clothing, reinforcing the complexity and hybridity of consumer practices.

The final phase synthesised qualitative and quantitative insights to refine the preliminary categories into six comprehensive consumer archetypes [Tab. 03]. Each archetype integrates values, motivations, and behavioural tendencies, capturing the tension between sustainability aspirations and actual consumption practices.

DISCUSSION & IMPLICATIONS FOR SMES

The study identifies clear behavioural patterns that define each archetype and provide SMEs with direct strategic implications, as outlined below.

As far as Purchasing Behaviours: Consumer profiles reveal differentiated consumption habits, ranging from reduced usage and consumption of substitute channels (second-hand websites or edited boutiques) to more conventional acquisition modes. For SMEs, the strategic reaction is to align their offer with these behaviours by emphasizing product longevity, developing repair and renovation services, and investigating partnerships with edited resale marketplaces. These tactics provide a competitive edge over seasonally operated, high-speed cycle production paradigms and allow SMEs access to customers who place a premium on durability and selectivity in their decisions.

On Values and Priorities: Archetypes also vary widely in terms of the values behind their decisions. Some are price-sensitive primarily, others by newness of look, and others again by environmental and ethical considerations. For SMEs, this variety implies that trying to reach all consumer archetypes at once is not possible or strategically strong. Rather, companies need to find segments that are most suited to their competencies and positioning. More specifically, sustainability-minded archetypes offer opportunities for SMEs that have the capability to truly tell a strong story about ethical manufacturing and ecological stewardship, so values become a tool of marketplace differentiation.

In Coping with Garment Defects: There are different behaviour reactions to defects in garments. There are archetypes (those to durability and thrift) to actively seek to fix or creatively reuse defective products as a good opportunity to increase the life of a product. Others (frugal consumers) would simply discard a product that is defective because it is cheap to replace. For SMEs, this is a strategic opportunity to build strong brand loyalty among the frugal segments. Offering affordable maintenance packages or adaptable repair workshops not only shows a company's commitment to product longevity but also generates a service-based, worthy revenue stream

In case of Ethical Challenges: Consumer archetypes show their real motive when facing ethical challenges. Certain archetypes (those very strongly committed to ethics and sustainability) categorically shun brands associated with undesirable labour practices or unsustainable processes, requiring radical openness as an absolute requirement for purchase. Others (whose loyalties lie between ethics and pragmatism) will tend to be ambivalent, eventually prioritizing price and short-term necessity over ethics. SMEs intending to pursue these segments need to be aware of this continuum. For the very ethical segment, honesty and transparent disclosure are essential. For the less altruistic segment, SMEs can close the *intention-action gap* by making the sustainable option easier, more convenient, or cheaper.

On Social Events: Consumer conduct on social events shows a stark dichotomy. While some archetypes (novelty and social utility-driven) have a tendency to buy a new piece of clothing for one occasion, others (resource-aware) re-style older clothes or borrow, reflecting resourcefulness and a direct opposition to wastefulness. Such opposition holds a special appeal for business. Services like styling consultation or renting premises can directly serve both markets: providing the style-conscious market with access to novelty without purchase, and access for the resource-conscious market to a pleasing, environmentally friendly option to new acquisition.

CONCLUSIONS

This study has demonstrated that while policy instruments like EPR and DPP provide the structural framework for sustainability (European Commission, 2022; Garcia-Torres et al., 2022), their success is fundamentally tie up to the resolution of the *intention-action gap.* By translating complex consumer behaviours into a diagnostic archetype framework, this study provides a mechanism to

navigate the cognitive biases that currently stall the adoption of Collaborative Fashion Consumption (CFC) models (Singh & Giacosa, 2019; Won & Kim, 2020).

In addition, the findings highlight that the circular transition is currently uneven, posing significant risks of marginalization for SMEs who lack the capital to compete with the sustainability strategies of major corporations (Eric, 2014; Standaert, 2022). However, the six archetypes, ranging from the *Ethical Researcher* to the *Style-Driven Shopper*, reveal that consumer motivations are not monolithic. This diversity offers SMEs a unique strategic opening. By moving away from transactional B2C models toward community-driven, social-collaborative loops, smaller actors can foster the radical transparency and emotional durability that larger, more rigid platforms struggle to replicate (Akbar & Hoffmann, 2023; Chowdhury et al., 2023).

Additionally, the participatory workshop provides a scalable methodological framework for researchers and practitioners. By employing scenario-based cards and visual mapping, SMEs can replicate this diagnostic process locally to identify S.PSS adoption barriers. Despite the small initial sample, the methodology's value lies in its operational flexibility; it can be adapted into digital applications or expanded for larger co-creation sessions and cross-cultural comparative studies.

Closing the *intention-action gap* requires the design of models that prioritize convenience and economic viability as much as ecological stewardship. For SMEs, the path forward lies in leveraging their agility to provide personalized, service-based solutions, such as repair workshops and curated rental offerings, that align with the specific values and coping mechanisms of diverse consumer segments. Future research should build upon this framework by utilizing Digital Product Passport (DPP) data to longitudinally track how these archetypal interventions impact actual garment longevity, thereby providing the empirical evidence needed to move from a culture of disposal to one of enduring collaborative value.

This study is subject to specific limitations. First, the small qualitative sample of design professionals provides technical depth but may not represent general population habits. Second, the EU geographic focus means findings regarding regulations and cultural values may not translate to regions with different environmental legislation. Finally, self-reported data remains susceptible to social desirability bias, potentially overstating sustainability commitments despite the focus on the *intention-action gap*.

CAPTIONS

[Fig. 01] Elaborated by the author; Overall Methodology applied - Workshop

[Fig. 02] Elaborated by the author; Scheme explaining the dynamic of the first board of the workshop

[Tab. 01] Elaborated by the author; Personal Consumption Mapping Findings 1/2.

[Tab. 02] Elaborated by the author; Personal Consumption Mapping Findings 2/2.

[Tab. 03] Elaborated by the author; Final Archetypes.

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A SHARED LEXICON

RHITA GLOSSARY:

DESIGNING A LANGUAGE INFRASTRUCTURE FOR THE FUTURE OF FASHION

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Abstract

The contribution proposes the creation of a glossary that adopts a critical approach to questioning the role of the twin transitions — digital and green — in the Made in Italy fashion ecosystem. The aim is to build a dynamic semantic infrastructure capable of reducing terminological ambiguities, aligning heterogeneous actors, and making explicit the cultural implications of the socio-technical transformations currently underway. The identification of conceptual clusters was guided by a methodological approach that integrates desk research and qualitative document analysis, in line with the three areas of investigation of the RHITA project: the technological dimension, economic models, and human capital. The resulting lexicon represents a mediation between knowledge and needs, developed across heterogeneous contexts — universities, SMEs, artisans, designers, and government institutions — and guides both the architecture of the Web 3.0 platform and the co-design processes activated. The contribution highlights how the formalisation of a shared language, including within the field of design, can support collective sense-making practices, inter-actor coordination, and sustainable innovation, thereby configuring an interpretative framework that critically connects research and practice in the Italian fashion system.

Keywords: *Design Vocabulary, Fashion Ecosystems, Knowledge Infrastructures, AI-enabled Platforms, Fashion Value Chains*

INTRODUCTION: WHY A GLOSSARY FOR THE FUTURE OF FASHION PLATFORMS

Digital platforms have become key infrastructures in the contemporary fashion system. They operate as critical infrastructure, mediating knowledge, connecting actors, and deeply influencing how innovation, sustainability, and cultural heritage are perceived. However, the vocabulary used to describe these transformations is often unstable, generic or borrowed from other fields without critical adaptation. Terms such as innovation, digital, intelligence, or openness circulate widely, but their meanings vary by context, generating ambiguity rather than shared understanding.
The RHITA Glossary addresses this need by proposing a shared vocabulary that integrates technological transformation, cultural heritage, territorial specificity and human capital without simplifying or flattening the complexity of the phenomenon.
While words shape the way problems are framed, which actors are included and which futures become imaginable, language is treated as a matter of design in itself. From this perspective, the glossary cannot be conceived as a static vocabulary, but as a cognitive infrastructure that supports interpretation, dialogue and collaboration within the Italian fashion ecosystem. Each entry addresses concepts already active in contemporary debates, reformulating them through a design-oriented perspective. Meanings are understood as temporary

and evolving, and evaluated for their ability to guide reflection and action rather than prescribe solutions. In this way, the glossary is enriched through interdisciplinary collaboration, clarifies the project's epistemological positioning, and connects research and practice through definitions that are both theoretically grounded and accessible to designers, SMEs, artisans, and institutions. Conceived as a future-oriented compass, the glossary helps users navigate complexity and uncertainty without resorting to oversimplification. The proposed definitions not only clarify concepts, but also open up alternative scenarios for rethinking roles, relationships and responsibilities in contemporary fashion, strengthening the integration between academic research and strategic industrial practices. In this sense, RHITA becomes a conceptual and operational laboratory where language, knowledge and technology combine to design sustainable innovation.

METHODOLOGY

The development of the glossary was grounded in a methodology based on qualitative documentary analysis, oriented toward the critical reconstruction of emerging lexicons in the field of the socio-technical transformation processes shaping the fashion ecosystem. The glossary was developed as the outcome of a process of thematic coding and conceptual engineering aimed at constructing a semantic infrastructure capable of supporting processes of alignment and coordination, conceiving language as an active design variable in the redefinition of the interpretative and operational frameworks of the sector. The methodology responds to the need to elaborate a shared lexicon capable of functioning as a semantic interface among the different entities involved in the project. In a context characterized by high disciplinary and professional heterogeneity, terminological convergence becomes a preliminary and necessary condition for the activation of cooperative processes and for the construction of a common epistemic base.

This operational approach entailed a systematic desk research of primary academic sources, selected according to their theoretical and disciplinary relevance, with particular reference to scientific publications, monographs, and articles published in peer-reviewed journals in the fields of entrepreneurship, fashion studies, and technologies applied to fashion. The analysis adopted a critical-interpretative stance, aimed at identifying recurring semantic structures, cultural inflections, and areas of lexical slippage that characterize the current transitional phase.

The conceptual clusters structuring the glossary were identified through the analysis of the three spheres into which the RHITA project is articulated: the technological dimension, relating to digital infrastructures, enabling technologies, and computational tools; the economic dimension, concerning business models, platform strategies, and value-generation processes; and the sphere of human capital and local culture, including skills, tacit knowledge, and territorial dynamics. The identification of these clusters derives from a process of thematic coding that highlighted the recurrence of semantic nuclei consistent with these three areas of project articulation. Within this corpus, particular attention was devoted to contributions addressing digital platforms and artificial intelligence systems, considered as operational infrastructures that redefine the modes of production, use, and validation of knowledge within the fashion sector.

The lexicon extracted from these sources was analysed in relation to the role of platforms as coordination devices and of AI as an interpretative mediation agent of the structural elements underpinning the architecture of the RHITA platform itself. The glossary thus configures itself as a situated linguistic infrastructure, designed to support a fashion ecosystem that seeks to rethink itself through a conscious reformulation of its interpretative categories.

GLOSSARY

AI-BASED INTERPRETIVE AGENT

In the RHITA project, the AI-based interpretive agent is conceived as an artificial intelligence device oriented towards interpretation and sense-making (Weick, 1995), understood as a process through which actors construct meaning from complex and constantly changing contexts. The agent does not operate on a predictive basis, but develops through situated and culturally mediated processes emerging from the interaction between heterogeneous data. In this sense, artificial intelligence is not intended to replace human judgment, but to support the construction of shared understanding within the system.

Integrated into RHITA's Web 3.0 platform, the agent takes the form of a digital Oracle, a cognitive intermediary that does not anticipate outcomes but facilitates the critical exploration of knowledge produced within the collaborative ecosystem of Made in Italy fashion. Its epistemic function lies in its ability to make the project's information heritage interrogable, fostering connections between data, experiences and practices that would otherwise remain fragmented. Emphasising understanding rather than optimisation, the interpretative agent operates according to a non-hierarchical logic, making visible latent relationships between territories, production chains, design practices and knowledge. The Oracle guides the user along open paths, suggesting to potential users — designers, SMEs, artisans, students and institutions — ways of reading and critically connecting case studies, without imposing opaque value criteria (Kaur et al., 2022).

This is a model of augmented intelligence, in which technology is designed to amplify the cognitive and interpretative abilities of people within complex socio-technical systems (Norman, 2013), allowing them to compare scenarios and develop greater awareness of their design and production choices. By enabling a situated exploration of shared knowledge, the AI-based interpretative system contributes to the construction of a dialogical and collaborative fashion network among users. Artificial intelligence is an infrastructural element for sustainable and inclusive innovation (Floridi, 2019) capable of supporting reflective and learning processes.

CULTURAL INTEROPERABILITY

Cultural interoperability refers to the ability to interact and collaborate effectively across different institutional and territorial contexts, without negating the cultural specificities that characterise each segment of the Made in Italy fashion supply chain. Unlike established concepts of interoperability, which have historically focused on technical compatibility and standardised data exchange, RHITA adopts a perspective that integrates social and epistemic dimensions. In this framework, collaboration does not depend exclusively on the alignment of systems but rather on the possibility of constructing shared meanings based on situated practices and different interpretive frameworks (Heath et al., 2002) Cultural interoperability recognises that knowledge and production processes are deeply rooted in the contexts in which they emerge and develop. Consequently, cooperation requires mechanisms that mediate these differences, making them legible and negotiable.

Within the RHITA ecosystem, the Web 3.0 platform and the widespread Fashion Living Lab operate as relational infrastructures that support this mediation, fostering the encounter between local knowledge, specialist skills and shared strategic visions. Through these tools, cultural interoperability translates operationally into the possibility for SMEs, artisans, designers, and institutional stakeholders to co-design innovations while maintaining links to their own knowledge heritage. The sharing of practices, methodologies, and productive narratives occurs within learning networks reminiscent of the communities of practice described by Wenger (1998), in which knowledge develops through participation and collective experience. This structure enables the integration of artisanal tradition, local production, academic research, and technological experimentation into a dynamic and adaptive system. This approach also enables the scaling up of innovations developed at the interregional level, while maintaining the cultural identity of Made in Italy and building a collaborative value chain without standardisation, thereby strengthening the resilience of local supply chains in a global context (Manzini, 2015).

DIGITAL INCLUSIVITY

Digital inclusivity refers to the concrete possibility for all players in the fashion supply chain to engage with complex technological environments without these environments becoming factors of exclusion or implicit selection (Eubanks, 2018). Within the RHITA framework, this principle takes on structural relevance, as the project recognises that the digital transformation of Made in Italy cannot be considered just a technological process. On the contrary, the introduction of advanced technologies risks amplifying existing inequalities between actors with established resources and skills and more fragile entities, such as micro-enterprises and artisan workshops. For this reason, digital inclusivity is addressed as a design and cultural issue, rather than a technological one (van Dijk, 2020).

Within RHITA, the Web 3.0 platform is conceived as a mediation device that makes Access is not

intended as the simple availability of digital resources, but as the actual ability to understand them and integrate them into one's own production processes. In this sense, knowledge sharing takes place through collaborative methods that redistribute skills and capacities for action among the various actors, promoting more active and informed forms of participation (Benkler, 2006). This approach responds to findings in the literature on the relationship between SMEs and digital innovation, which identify a lack of skills, difficulty in interpreting the value of technologies, and a perception of uncertainty as key factors that exclude them from innovation processes (OECD, 2021).

Digital inclusiveness in RHITA, therefore, manifests as guided experimentation and peer comparison. From this perspective, digital inclusiveness is an enabling condition for a fair and sustainable transition. The actors in the supply chain are not reduced to the role of passive users of predefined solutions but become subjects capable of consciously orienting their technological choices in relation to common productive and social objectives. In line with European strategies for a fair digital transition, RHITA interprets digital inclusiveness as a necessary condition for innovation in the fashion sector to be lasting and truly shared.

DATA MINING MODELS

Within the RHITA project, data mining models refer to a set of analytical practices through which heterogeneous data are explored to reveal recurring relations, latent configurations, and patterns of meaning within the fashion system that would otherwise remain opaque to descriptive observation alone. The data involved extend beyond quantitative indicators and include qualitative, narrative, and contextual materials gathered through territorial mappings, interviews, living archives, Living Lab observations, and documentation of production practices. Their heterogeneity reflects the composite nature of fashion systems, where cultural, social, and technical dimensions are tightly entangled (Bowker & Star, 1999).

In RHITA, and particularly within the activities developed in M3, data mining supports the integration and modelling of data related to Italian fashion supply chains across different regions. The extracted relations function as interpretive resources that help articulate connections between human capital, production practices, educational assets, technologies, and territorial conditions. Data extraction thus accompanies the construction of open and revisable interpretive frameworks. This approach is supported by STS perspectives that understand data infrastructures as situated and contingent arrangements, shaped by practices of use and interpretation (Granovetter, M. S., 1973). Analytical models help reveal recurrences and discontinuities across territories, surface latent connections between actors and practices, and inform matchmaking and co-design activities within the RHITA platform. Data mining operates as a sense-supporting technology, embedded in processes of collective interpretation and dialogue, contributing to rendering the complexity of the fashion system intelligible and sustaining a plural and situated understanding of Made in Italy fashion system (Suchman, 2007; Kitchin, 2014).

EMBODIED HERITAGE

Embodied heritage means that the fashion system's heritage is a dynamic form of knowledge, constantly renewed by practice and the lived experience of human capital. Sensitivity to the use of materials, technical skills, and cultural values is incorporated into manufacturing and everyday practices, transmitted through creation, teaching, and professional experience. This perspective aligns with approaches that define heritage as a cultural practice continuously produced and renewed through use and interpretation (Smith, 2007). Therefore, tangible and intangible evidence represent operational resources whose value is realised through use.

What Polanyi defines as *tacit knowledge* also plays a fundamental role in fashion production and design (Polanyi, 1966). Although this type of knowledge cannot be fully captured through documentary evidence (artefacts, drawings, production machinery) alone, its transmission is ensured by secondary and university education courses that facilitate its transfer from experts to younger generations. Embodied heritage, therefore, brings to the fore forms of expertise that are inseparable from their respective contexts of production (Haraway, 1988). In the context of RHITA, embodied heritage facilitates connections between generations, disciplines and local manufacturing traditions. Human capital mappings and their

audio testimonials allow historical know-how to inform contemporary design and manufacturing challenges, such as sustainability, circularity, and digital transformation, without reducing heritage to nostalgia or mere symbolic value.
The digital platform supports this process by expanding access and visibility; however, it is not intended to replace direct learning and engagement. Without these elements, heritage risks becoming decontextualised and inert. Embodied heritage is therefore based on relationships, mentorship and shared practice as essential conditions for the circulation of knowledge (Sennett, 2008). Considering heritage as embodied, RHITA frames preservation as an active, future-oriented process, supported by continuous use, transmission and transformation by individuals and practices.

EMERGING CONNECTION

Emerging connection refers to the formation of relational configurations within fashion ecosystems. The term highlights relational emergence as a design condition where connections are cultivated through shared practices and situated collaboration. Different actors, knowledge, materials, and technologies become part of one unique system, in which they are interconnected beyond their predefined roles. Within the project RHITA, these situated connections operate as a socio-technical infrastructure that facilitates the recombination of heterogeneous competencies. Designers, SMEs, artisans, researchers, and institutions encounter one another through platforms, living labs, and shared projects that allow latent complementarities to surface. Innovation is thus understood as a relational process, arising from interaction rather than from isolated actors or standalone technologies (Hargadon & Sutton, 1997).
As these connections intensify, established separations between production, research and education begin to loosen. Cross-sectoral encounters introduce forms of relational proximity that resemble what Granovetter (1973) identifies as *weak ties*: relations that are neither fully stabilised nor marginal, yet capable of opening unexpected pathways for collaboration and knowledge circulation. In fashion ecosystems marked by fragmentation and asymmetry, such ties acquire strategic relevance through their generative uncertainty. RHITA frames emerging connection as an open and interpretive practice. The platform creates conditions for encounters that users can negotiate and reinterpret over time. Matchmaking becomes a reflective process oriented toward possibility and mutual learning, supporting collaborative futures grounded in relational diversity rather than efficiency or scalability alone.

EUROPEAN NETWORKS

European networks, within the conceptual horizon of RHITA, take shape as relational spaces in which exchange precedes alignment. They operate through encounters among heterogeneous fashion, design and research ecosystems, enabling practices, tools and perspectives to move across territorial boundaries while remaining anchored to the contexts from which they emerge. What circulates is rarely a finished model; more often, it is a fragment of experience, a method, a way of framing a problem that becomes intelligible through comparison and translation. Such networks function as socio-cultural infrastructures that sustain learning and applied knowledge-sharing through participation. Knowledge develops in use, through exposure to other ways of organising production, research and design practice, and through the productive friction generated when these differences meet. This dynamic resonates with situated learning approaches, in which understanding grows within communities of practice rather than through abstract transfer (Lave & Wenger, 1991). European networks increasingly operate as operational environments in which shared research agendas, experimental programmes and collaborative projects are articulated across institutions and territories. Common research calls, transnational labs and thematic clusters enable issues such as sustainability, digital manufacturing and cultural heritage to be explored collectively, while remaining open to contextual variation (Callon, 1986).

For Italian fashion actors engaged in RHITA, participation in these networks opens a field of relation in which digital transformation and heritage are approached through confrontation with other European trajectories. Knowledge circulates as embodied experience and contextual judgement, shaped by local histories of making, but also through structured moments of comparison with enterprises, service providers and innovation hubs. European networks create occasions for encounter between SMEs, designers, researchers and industrial partners, allowing

affinities and complementarities to emerge through direct interaction rather than through formal classification, sustaining forms of connection that allow fashion ecosystems to remain open, porous and relational, without converging toward uniform trajectories.

HYBRID MANUFACTURING

The term Hybrid Manufacturing refers to production processes that integrate traditional craft manufacturing with advanced digital technologies, generating hybrid production systems in which human manual skills and technology coexist and mutually reinforce one another (Golsteijn et al., 2014). This notion reflects a design tension between preserving local knowledge rooted in territories and introducing innovative tools to expand the expressive and operational capabilities of micro and small fashion businesses (Bertola & Teunissen, 2018). The idea of "hybrid" should not be understood as a simple combination of heterogeneous techniques, but as a complex socio-technical configuration in which materials, processes, knowledge and digital technologies enter into a continuous and non-hierarchical dialogue. From this perspective, hybrid manufacturing fits within a paradigm of material-digital co-construction, in which design emerges from the interaction between embodied skills and computational systems.

In contrast to a techno-centric view of digital manufacturing, hybrid models challenge the notion that automation replaces human labour, proposing instead a blend of technologies within existing processes. The hybrid nature of manufacturing also implies a redefinition of design roles: the designer is no longer just a creator, but a facilitator of technical assemblies between analogue and digital inputs, and at the same time, the craftsman takes on the role of a disciplinary and cognitive node within an augmented production system, in which tacit knowledge – made up of gestures, timing and material resistance – becomes a critical resource for innovation (Sennett, 2008). In this sense, hybrid manufacturing is not only a technical-productive model but also a cultural and political device that redefines the value of making, time, and work within contemporary creative economies.

SENSE-MAKING

Sense-making unfolds as a situated practice through which complexity becomes intelligible by tracing relations, recurrences and displacements across heterogeneous elements. Meaning takes form within action, as actors attend to signals, experiences and fragments of information while positioning themselves inside evolving socio-technical environments. Understanding grows through partial readings, pauses, and recalibrations, sedimenting over time through use rather than through abstraction or formalisation (Weick, 1995). Within the project RHITA, sense-making is woven into the very conditions through which knowledge is accessed and navigated. Data, case studies, technological options and territorial practices are encountered as constellations, whose significance emerges through juxtaposition and movement. Users advance by following resonances, inconsistencies and thresholds of relevance, allowing interpretation to proceed through exploration and proximity. Indeterminacy remains operative, sustaining attention and inquiry rather than requiring premature resolution.

As interpretive trajectories unfold, meaning is continuously negotiated in relation to prior experience, embodied expertise and situational concerns. This dynamic aligns with constructivist and communication-based approaches that frame understanding as an activity shaped by context, purpose and positionality (Dervin, 1998). Knowledge stabilises temporarily as working orientation, only to be re-opened when new relations or constraints intervene. Similar processes have been described within studies of organisational learning, where sense-making operates as an ongoing adjustment between expectation and experience (Argyris & Schön, 1978). In fashion ecosystems, where cultural values, economic pressures and technological choices intersect unevenly, sense-making supports forms of orientation attentive to specificity and change. Within RHITA, it enables reflective engagement with design and production decisions, allowing actors to situate their choices within broader relational fields. The platform developed within the project functions as a cognitive infrastructure that amplifies this interpretive capacity, sustaining meaning as something that emerges through relational engagement, comparison and situated judgement rather than through simplification or linear explanation.

INDUSTRIAL SYMBIOSIS

Industrial symbiosis is a complex, systemic form of collaboration in which industries from unrelated sectors operate as interconnected ecosystems rather than isolated supply chains. In the context of the fashion system, industrial symbiosis denotes a deliberate and cooperative approach to circular production, where companies, institutions, and users share materials, energy, water, by-products, knowledge, and infrastructure to co-create value and reduce systemic environmental impacts. These collaborations are primarily driven by the creation and circulation of shared knowledge within networks, which generate synergies, rather than by the mere exchange of physical resources (Lombardi & Laybourn, 2012). Consequently, material flows are facilitated by relational dynamics, trust, and collective learning, rather than by efficiency gains alone. While industrial symbiosis may benefit from geographical proximity and territorial embeddedness, such proximity is not essential; the critical factor is the ability to coordinate actors across organisational and sectoral boundaries.

The RHITA ecosystem promotes industrial symbiosis, facilitating cyclical resource flows where the waste and surplus of one industry become inputs for another. Within this context, improvements in eco-efficiency are viewed as a result of collaboration, rather than its primary goal. Furthermore, eco-innovation—which includes technological, organisational, and social aspects—acts as a critical enabler (Lombardi & Laybourn, 2012; Chertow, 2000; G.U., d.lgs. 152/2006, art. 184-bis). This approach signifies a transition from considering circularity as a mere guiding principle to implementing it as an operational practice. From a design and supply chain perspective, industrial symbiosis requires the deliberate design of products and processes for durability, disassembly, and component standardisation, thereby enabling reuse, remanufacturing, and the preservation of functional value prior to recycling (Sbordone et al., 2022). At the inter-firm level, this translates into closed-loop supply chains and symbiotic practices where waste and by-products are requalified as secondary raw materials, supported by traceability systems, technical specifications, and quality controls that minimise downcycling (Tonin, 2025).

OPEN-ENDED DESIGN

Open-ended design is a non-linear approach to design that avoids defining objectives and final results in advance. Design is understood as an open process that can change direction in response to new knowledge, constraints, and relationships among the actors involved. This non-teleological approach considers uncertainty not as a problem to be solved, but as a proper condition for learning, adapting and changing. In this sense, design is framed as a generative practice embedded in the complexity of social, cultural and productive systems. Therefore, its value lies not in providing stable answers but in tracing connections and guiding action over time, outlining trajectories that allow projects to evolve as contexts and surrounding conditions change (Heskett, 2002); thus, decisions remain provisional rather than definitive (Schön, 1983). From a systemic perspective, open-ended design aligns with approaches that consider design as an enabling framework for social and cultural transformation. In this sense, rather than operating as an optimisation tool, design acts as a practice capable of navigating complexity, creating the conditions for different actors to participate, adapt and generate value over time (Manzini, 2015). RHITA adopts this approach to challenge static, linear models: rather than producing a single future, it supports multiple trajectories shaped by local constraints, cultural practices, and emerging forms of knowledge that cannot be fully anticipated (Escobar, 2018). Design becomes a way of dealing with complexity, enabling processes that remain sensitive to difference rather than closing it off. In practice, open-ended design shifts the designer's role from problem solver to facilitator. What is designed are not outcomes, but trajectories, structures, relationships, and processes that others can evolve, adapt, and extend over time, thereby allowing new solutions to emerge.

SITUATED AND OPEN KNOWLEDGE

Situated and open knowledge refers to ways of knowing that are made accessible yet remain rooted to the social, cultural, and territorial conditions in which they're created. This view challenges the idea of knowledge as universal, instead seeing it as a practice that's closely connected to the network of relationships in a specific context (Haraway, 1988). This approach, while considering the global context, avoids simplification and homogenisation and integrates the local and global dimensions. In the context of fashion and the RHITA project,

this includes craft traditions, the manufacturing skills of specific districts and educational contexts. These forms of knowledge are based on proximity to certain materials specific to places, supply chains and communities.
Openness does not indicate a loss of context, but rather the deliberate design of processes that allow knowledge to circulate beyond its original sphere without losing its specificity. It is therefore understood as an enabling condition for the exchange of knowledge, disciplines, and points of view, capable of generating new connections without flattening differences. Drawing on open design approaches, RHITA treats knowledge as an infrastructural resource composed not only of artefacts, but also of methods, decision-making processes and learning paths that can be shared, adapted and reactivated in different contexts (van Abel et al., 2011). This circulation is supported by communities of practice, where knowledge develops through participation and evolves as it moves across different and interconnected professional and educational environments (Wenger, 1998). Intergenerational exchange plays a central role in this process: mentoring, collaborative experimentation and education enable the transmission and transformation of experience-based knowledge over time, ensuring continuity while allowing for change. Against this backdrop, open and situated knowledge supports fashion ecosystems that can innovate without flattening aesthetics, traditions or meaning.

SLOW INNOVATION

Within the conceptual framework of RHITA, slow innovation defines an orientation towards change that recognises time as a structural variable of the project, necessary to accompany the transformation of fashion supply chains. It is an innovation paradigm that opposes the dominant logic of accelerated innovation, often oriented towards immediate scalability and short-term performance, and instead proposes an approach that values the complexity of processes and the sedimentation of knowledge. As Steen (2021) observes, innovation that ignores social and cultural dynamics risks producing technically efficient but fragile solutions that cannot be permanently integrated into existing systems.
In the field of design and fashion, slow innovation is part of a broader movement of sustainable design and slow design, which connects value creation with ethical and sustainable practices (Fletcher, 2010). The principles of slow fashion, for example, emphasise an approach to fashion that reflects a slower pace of production and consumption, emphasising quality, durability, transparency and cultural significance over the speed of production typical of fast fashion (Clark, 2008). In this sense, slow innovation not only recognises the value of time in the creative and production processes, but also the need to deeply integrate social and environmental dimensions into innovation models and to reflectively evolve design practices. RHITA adopts this extended temporality as a condition for fostering progressive learning processes within micro and small enterprises. In line with Rosa's (2013) analysis, which highlights how systemic acceleration reduces individuals' capacity to assimilate change, the project favours paths that enable actors to develop stable skills and renegotiate established practices and new sensibilities. In this sense, slow innovation does not represent a renunciation of development, but a strategy to make innovation compatible with long-term sustainability and with the transmission of knowledge that constitutes the distinctive value of Made in Italy (Ingold, 2013).

CONCLUSIONS

The glossary, as a conceptual framework, served as a design tool to structure the architecture of the RHITA platform and to guide the organisation of its content, informing the selection, articulation, and interconnections of terms across heterogeneous fields. By taking language as infrastructure, each section becomes an operational translation of the conceptual categories developed in the lexicon. The one dedicated to Shaping Made in Italy, for example, visually represents the concepts of embodied heritage and situated, open knowledge within the national territory, highlighting how skills, production traditions, and educational pathways are rooted in local contexts while remaining capable of evolving along new trajectories. Discussions with companies, master craftsmen, designers, and curators enabled a sharper focus on the principles of slow innovation and industrial symbiosis, giving tangible form to emerging connections. Circularity, collaboration between businesses and universities, digitalisation, and regulatory redefinition thus emerge as relational nodes within a system in transformation. The projects, developed through a participatory,

design-driven approach, also operate within the framework of open-ended design, proposing experiments that connect heritage, technologies, hybrid manufacturing, and sustainability, thereby configuring the project as a process rather than a definitive outcome.

Finally, the Oracle conversational agent enables dialogical exploration of the content and extends and dynamises the platform's infrastructural function. The interaction goes beyond the mere gathering of information; it establishes connections between users' questions and the constellation of Italian fashion realities, activates sense-making processes, and ensures semantic consistency even in the personalisation of the experience.

Designing a lexicon constitutes a fundamental moment of reflection in defining shared futures. As Haraway reminds us, "it matters what stories make worlds, what worlds make stories" (2016, p. 12): words do not merely describe processes; they render them recognisable, legitimise their emergence, and guide their development. The glossary, therefore, stabilises a field of emerging meanings, enabling different actors (companies, artisans, institutions, researchers, designers) to converge without erasing their specificities, translating them instead into a shared design resource. The RHITA project experience emphasises that the sustainable transformation of the fashion system cannot be entrusted exclusively to technological tools or regulatory frameworks; it entails a cultural choice, within which the sharing of a common language constitutes a space for imagination and for envisioning the future of Made in Italy fashion.

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