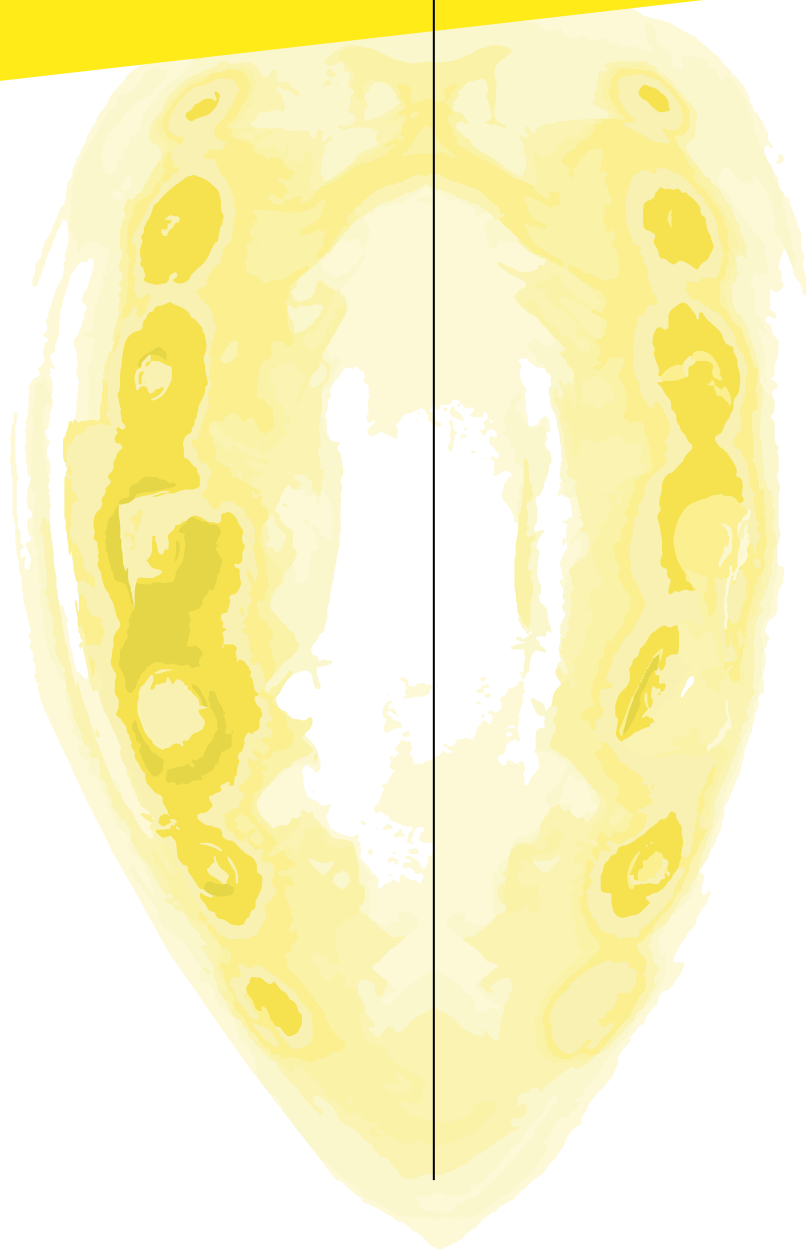


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# EDITORIAL

## ELISABETTA CIANFANELLI

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This first issue of Fashion Highlight marks the birth of a new journal in the fashion studies landscape, with the aim of sharing advances in scientific research in fashion nationally and internationally, contributing to current and future debates, disseminating original and innovative research, and supporting scenarios under construction in the digital and physical territories of the contemporary. The space of fashion in design cultures in academia is increasingly relevant and recognized, although it is the outcome of a rather recent path, which is nourished by the constant dialogue with historical, social, legal and scientific disciplines. There are many aspects that bring fashion, with its practices and research, closer to other dimensions of the project, such as design and architecture, but equally numerous are the elements of specificity, starting with its connection to the body and the issues of gender identity that this implies. For these reasons, it is important to identify spaces dedicated to the complex territory that characterizes academic fashion research, spaces that Fashion Highlight aims to inhabit, to further strengthen this process of defining identity, of identities.

Fashion is here considered in its characteristic tension between past and present, as a catalyst for the instances and languages of interpretation of the contemporary. The editorial project therefore accommodates its explorations from the aspects of environmental, social, economic and digital sustainability of the project, moving between past and present. It welcomes research on aspects related to craftsmanship, the preservation of deep-rooted manufacturing processes and new generative, computational and AI frontiers, as well as the study of new materials and fibers with high longevity, regenerated and recycled. Also considered of great interest are issues related to the relationship and communication between physical and digital, the management of integrated processes from concept to sale, and the development of digital technologies in the fashion system for performance and safety improvement. Also of particular interest are the relationships between global and local, with the overcoming of Eurocentric visions and the opening to alternative histories. Also included in this cultural research space are studies concerning

new teaching methods and training tools in the industry.

In the complexity of the fashion system, scientific research is the result of relationships and connections between different disciplinary areas, and Fashion Highlight aims to be an open space of trans-disciplinary and cross-sectoral confrontation. The ecological and digital transitions involve the fashion system making it necessary to study and understand the transformations taking place, in order to be able to disseminate research and offer companies support to operate in the contemporary. The journal was born in the Italian research system, where the process of positioning fashion within project cultures is still ongoing and is fed by the local and global confrontation between the educational, creative and productive system of fashion it represents.

Fashion Highlight aims to be a space for sharing ongoing research and ideas in the making, particularly by PhD students who have recently started their own research path. In fact, there are two sections: "Essays," which includes scientific articles positively evaluated by double blind peer-review, and "Shaping Research," which offers the opportunity for young researchers to approach the academic literature and start disseminating their ideas, also thanks to the open access mode and the absence of publication costs.

I conclude this first editorial of Fashion Highlight by thanking all the colors that made it possible to embark on this adventure: the University of Florence and the Department of Architecture DIDA, for the constant support in our research activities; Firenze University Press, for agreeing to publish the journal and to disseminate it within the international scientific community; the two deputy directors, Prof. Chiara Colombi and Prof. Gabriele Goretti, the scientific board, editorial board, editorial staff and reviewers, who contribute to the scientific quality of Fashion Highlight and will make it grow with their ideas.

# **FASHION DESIGN PRACTICES AND EMERGING TRANSFORMATIONS**

## **A CASE OF INTERDEPENDENCE BETWEEN FASHION CREATIVE PROCESSES AND MANUFACTURING SYSTEM IN THE MADE IN ITALY DISTRICTS**

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## Abstract

The current article focuses on emerging transformations in fashion creative processes in regard of the enhancement of digitalization processes, the opportunities offered by new sustainable business models, and a new relation between user, production, and consumption. In particular, this article discusses the case of the Italian manufacturing districts where digitalization strongly pervades the production, integrating the local craftsmanship savoir-faire with up-to-date technologies. Within the strategic duo “fashion and technology”, we highlight emerging opportunities for the integration of creative processes and manufacturing skills. Moreover, the need for sustainable practices offers new significant insights into the integration of the roles of the designer and manufacturing processes. Moving from this discussion, the article presents an overview of ongoing transformations of fashion design practices in relation to the technological and social issues, offering a framework to read the articles included in this issue.

**Keywords:** Fashion Design, Creative Processes, New European Bauhaus, Digitalization Sustainability

### **The Contemporary Fashion Industry in the Global Industrial Economy and Societal Changes**

The current turbulence in the economy and industries globally, which is both dynamic and complex, is sharpening and exacerbating challenges that the contemporary fashion industry – as a network of interrelated stakeholders including brands and designers, manufacturers, distributors, retailers, and consumers – has been facing in the last two decades. Geopolitical risks, such as political instability, conflicts, trade wars, and protectionist policies, are creating challenges for businesses that operate in affected regions or rely on global trade and on imported goods or services. The COVID-19 pandemic has also had a profound impact on the global economy, causing significant disruptions to supply chains, reducing consumer spending, and leading to job losses and business closures (McKibbin & Fernando, 2020). Lockdowns and border closures disrupted the movement of goods and labour, leading to delays in production and delivery, and causing a backlog of inventory. In fact, the COVID-19 pandemic has created significant uncertainty and volatility in the fashion industry, worsening the existing vulnerability and leading to its disruptions.

In addition, the pandemic led to a shift in consumer preferences and buying patterns, with a decrease in demand for specific merchandise categories, such as formalwear and outerwear, and an increased attention and desire for casualwear and athleisure (McKinsey & Company, 2021). These new consumption behaviours have pushed the evolution of a new concept of occasion of use toward a faster and further blurring among product categories, thus requiring a new design and planning approach to fashion collections. This shift in demand caught fashion companies unprepared and highlighted the inflexibility of their supply chains even more.

The need for greater adaptability and resilience of the fashion supply chains is also exacerbated in light of the digital acceleration affecting all sectors, not only in support of the shift to phygital retail but also in favour of improvements to interoperability, higher traceability, and transparency across manufacturing, logistics, and distribution (Casciani et al., 2022).

While traditional fashion companies are dramatically lagging behind in the process of digital transition at operational and managerial levels, the request by consumers for transparency relates not only to the concept of environmental and economic

sustainability but it refers also to an emerging social and civic consciousness under the increasing demand for responsible practices and products. The social dimension of innovation (Penati, 1999; Pinch, 2005; Bucci, 2010), embedded into a sustainable development, moves from a simplistic technology-driven concept in favour of design-driven approach, focusing on the construction of meanings (Krippendorff, 1989, 1990, 2006; Norman & Verganti, 2014; Bertola et al., 2018) in processes and products and on the centrality of the role of human beings.

This reflects in the consideration that the fashion industry does not simply correspond to its supply chain, but it refers to a creative and cultural industry where tangible and intangible products and specific modes of production concur to convey cultural and symbolic meanings that are significant for consumers and that correlate with the value of a company (Bertola et al., 2016).

Within this framework, the principles of the New European Bauhaus (European Commission, 2021) – aesthetics responding to needs and improving quality of experience beyond functionality, environmental sustainability, and inclusion –, empowered by digital transition but also integrated by a holistic approach to sustainability (Hawkes, 2001; UCLG, 2010), characterizes the contemporary arena in which the fashion industry restructures towards hybrid value chains where brands, supply chains, and consumers enter new relationships while redefining processes, products, and services (Bertola et al., 2018).

In this context, the management of the fashion creative processes, harnessing the adoption of digital technologies, is of the utmost importance in order to empower a positive transition towards efficient and sustainable productions and responsible cultural and consumption dynamics.

### **Fashion Creative Processes towards Digitalization and Sustainability Pathways**

Highly efficient and streamlined creative processes and collaborative practices, empowered by digital technologies, are at the centre of restructuring the relationship between research, production, distribution, and consumption, thereby highlighting a renewed integration of the creative processes and the manufacturing system.

The application of digital technologies, such as 3D virtual and digital technologies (Casciani

et al., 2022), and more in general the paradigm of industry 4.0 (Bertola et al., 2016) offer the opportunity to restructuring the linear supply chain of traditional fashion companies, which sees each phase as closed, with decisions taken before the launch of the next step. This reasoning can be replaced with multiple iterations within the ideation phase, as digital technologies facilitate design decisions in digital and virtual context, exploring and validating the design possibilities. New design solutions can be achieved, for example, thanks to the evaluation of possible construction choices supported by mathematic information on 2D/3D geometries and 3D, advanced, and automated manufacturing processes. Therefore, prototyping aided by such technologies becomes a tool for idea generation and not simply for testing solutions. Moreover, design options created in digital and virtual spaces can drive the request for new basic and applied research, as in the case of the choices of materials and fabrics which are interdependent with product construction solutions and manufacturing processes. This leads to multiple iterations between the product design, prototyping, and product development phases, which, together, act as an experimentation cycle. The hands-on logic of these processes streamlines design choices, helps to assess manufacturing solutions and processes, reduces environmental impact, and improves resource efficiency. Moreover, in this streamlined process, experimentation is configured as a multifaceted component of the creative process that needs to be integrated in-house to ensure a strategic advantage so that fashion companies exercise full control over design-driven decisions. Keeping control in-house leads to a more agile supply chain by aggregating different phases in multidimensional and interoperative loops, thus reducing companies' dependency on external suppliers and increasing the responsiveness of the supply chain itself. Nurturing creative processes with digital technologies allows to reduce the environmental and economic impacts, due to overproduction and waste generation, and to promote new scenarios for fair and equitable labour and for competence and skills development.

The integration of data-driven recommendation and generative systems, from research and idea generation down to product development, offer a further positive impact in regard of social and cultural sustainability goalposts. In fact, the collaborative dimension among the actors involved in research and design development is extended

to consumers whose insights – elaborated from personal data, preferences, and interactions with brands, products, and communities collected via applications and social media platforms – are converted into institutionalized input for a smart and co-creative process. Big data and artificial intelligence allow fashion brands to align decisions with emerging consumers' behaviours by diversifying aesthetics and functional standards, potentially promoting diversity and inclusiveness, beyond the traditional personalization and customization practices. Beyond a mere tech-enthusiasm, new research strands are debating the ethical implications of the use of consumers' data and artificial intelligence. However, we can see the limitations of the industry 4.0 paradigm and the opportunities that the industry 5.0 shift (European Commission, 2021) offers in terms of collaboration between humans and machines to boost human creativity and manufacturing skills, towards a more sustainable society.

In this scenario, the integration of traditional know-how and digitalization represents a key aspect, and also a challenge, in the complex productive context of fashion. The Made in Italy manufacturing districts represent an emblematic case study of a value ecosystem, where the production is immersed in innovative technological systems and products are the result of a collective negotiation among different stakeholders, all participating in the economic, social and environmental co-evolution of the system they are part of (Serrano et al., 2018; 2022).

### **The Case Study of Fashion Made in Italy**

Italian manufacturing processes in the high-end fashion include a complex system of intellectual and manual know-how that merges heritage and tradition with innovation and contemporary demands, high-end market positioning with ethics, and craftsmanship with mass-production. “Made in Italy” industrial districts are specific geographical areas in which networks of companies specialized in production processes have established a model that deeply links industrial culture, know-how, and genius loci. These districts integrate creativity and production know-how through extraordinary competitive skills and design-driven innovation, based on a time-tested production system and design processes that interpret emerging trends and global customer expectations (Goretti & Chikh M'hamed, 2022).

The “Made in Italy” model stands not only as a productive economic phenomenon, but also as a cultural manifestation rooted in fundamental historical elements that originate precisely in the product-territory-society synergy. Italian manufacturing districts are made up of a constellation of small and medium-sized enterprises (SMEs) with articulated production differentiation and a collaborative structure based on mechanisms of exchange and trust in which the artisan component strongly affects the competitive advantage of companies (Rullani, 2014). These elements characterize this specific production model (Becattini, 2004) by transferring the cultural aspects of the territory and the intangible values of “Made in Italy” into a product recognizable for its strong and significant aesthetics (Morace & Lanzone, 2010).

SMEs in high-end fashion, in which traditional craftsmanship plays a central role, today find themselves facing challenges of a global scope, with the effects perceptible in the local dimension. The Italian manufacturing system presents significant integration between savoir-faire, based on “thinking-in-action” processes embedded in SMEs' attitudes (Goretti, 2022), and advanced digital technologies. This synergy develops into what is usually called “advanced craftsmanship”. In these contexts, on the one hand, quality in production in high-end manufacturing is developed through the use of advanced machineries. The digital and sustainable transition explained above causes intense repercussions on value chains (Schwab, 2017), affecting them in operational, organizational, and management terms (Epifani, 2020; Nambisan et al., 2017). On the other hand, the introduction of innovative technologies can co-exist with the artisanal values embedded in the local production savoir-faire. SMEs based on artisanal processes, often the backbone of many production systems (Brozzi et al., 2018), can take advantage of local specificities (Floridi, 2020), projecting them into a global context (Zabulis et al., 2019) while developing a glocal manufacturing approach. Development of up-to-date services and time-to-market optimization allows SMEs to be part of the global value chain, while respecting their identity and intrinsic genius loci.

According to Teece (2017), dynamic capabilities are among the most important skills of a manufacturing firm, contributing to their ability to manage their resources and skills in order to exploit the aforementioned skills and mitigate risks

in the fast-changing environment according to market and design trend transformations. Table 1 illustrates how the dynamic capabilities of fashion manufacturing SMEs are able to integrate digital transformation within the manufacturing process. Production firms are creating a new strategy in the digital era to quickly respond to the changing market environment. More specifically, the dynamic capabilities of a SME in the apparel industry facilitate the integration of new processes and products into the existing system and gain a competitive advantage (Teece, 2017).

Within this transition, which is still in process, we highlight common patterns in the digital transformation of Italian SME manufacturing districts:

- Paths of technological innovation are developed in production processes through technology transfer from other production contexts (e.g., the transfer of precision technologies from the automotive system to the fashion sector, as parametric design in modelling of fashion metal gears or ultimate advanced technologies in laser cutting);
- Preservation of craftsmanship values within the implementation of technological innovation in/of

the supply chain (e.g., the integration of advanced machines and manual processes in leather goods production);

- Improvements in production planning and time-to-market, procurement of materials, traceability and certification of product authenticity through new digital archiving systems, and the use of up-to-date PLM platforms.

Within this transformation in Italy's manufacturing districts, the urge for environmental sustainability becomes a platform for integrating innovation and the recovery of "historical" manufacturing processes. Prato's textile district represents an emblematic example. It has been known for its wool textile manufacture since medieval times. The city's textile vocation dates back to the 12th Century and was exploited around the second half of the 19th Century with the opening of new markets. Prato is known in particular for regenerated wool processes called Cardato (carded), as well as textile recycling in general. Carding is a specific way of processing fibres where yarn is produced using virgin fibres but also by reusing fibres obtained from recycling old clothing or knits, and cuttings of new fabrics used in the garment industry.

CATEGORIES	INDICATORS	
Dynamic Capabilities	Sense	Identify and assess opportunities outside the company
	Seize	Capture value from those opportunities
	Transform/ Reconfigure	Redesign the business model and realign tangible and intangible assets
Digitalization	Digital Transformation	Implement digital technologies

Table 01

Currently, the Associazione per il Tessile Riciclato<sup>1</sup> includes the majority of recycling SMEs certified through Textile Exchange Label<sup>2</sup>. Many production steps are developed by traditional techniques avoiding polluting treatments thanks to a “green supply chain management” (GSCM) (Islam et al., 2022). For example, textile materials are grouped based on colour before initiating the recycling path. Through this differentiation, the regenerated cloth will not need to be coloured again, avoiding a significantly polluting step.

Based upon this ancient know-how, Cardato Regenerated CO2Neutral<sup>3</sup> trademark was created in 2015 to offer market fashion leaders eco-friendly products according to European Commission requirements (Ellen MacArthur Foundation, 2013). Its development is based on assessing water and energy consumption levels and CO<sub>2</sub> emissions from the manufacturing processes. According to [solomodasostenibile.it](https://www.solomodasostenibile.it)<sup>4</sup>, fashion and technology represent a strategic “duo”, especially regarding sustainability in production and consumption. As represented by Cardato Regenerated CO2Neutral, the synergy in between innovation in manufacturing and creative processes play a crucial role in introducing virtuous production process and eco-friendly materials into the fashion system, by implementing it in new design collections and product storytelling. For example, Tiziano Guardini, emerging designer strongly focusing on sustainability, is closely collaborating with SMEs manufacturing Cardato certified fabrics. The designer selects their materials and develops the concepts that emphasize this specific production process rediscovered by Prato district, working on the resulting special finishings and texture. Guardini, taking in consideration technology advancements in manufacturing, develops fashion products as “manifesto” of a new fashion mood where new shapes and details are combined with eco-friendly meanings. Tiziano Guardini<sup>5</sup> has been the winner of Green Fashion Award 2017<sup>6</sup>.

The relationship between fashion design and manufacturing is often not totally proactive, with manufacturing occupying a role as a developer and problem-solver rather than a collaborator in design implementation (Fry et al., 2017). Designers’ creative ideas frequently relate directly to up-to-date production advancements within production clusters that promote their achievements in fashion B2B fairs (i.e., Première Vision in Paris, Milano Unica in Milan, Techtextile in Frankfurt). Then the fashion design departments select the most interesting raw materials and samples to implement their work. There is a sort of “mutual dependence” between designers and manufacturing SMEs but without a proper integrated proactive dialectic. However, in recent decades, we can see that emerging practices offer significant new stages to the designer-manufacturer relationship.

The case of Prato textile district shows the emerging potential of SME manufacturing clusters in Italy not only as production districts but also as cradles of up-to-date technologies and best practices in process innovation. Within this context, designers can develop creative processes interdependent with the advancements in manufacturing, setting a proactive relation with brand-new production achievements as new craft processes and techniques, while pursuing higher sustainability levels.

In March 2021, National Geographic published an article about the Prato textile district and included on the cover a dramatic image of a large bunch of used fabrics. The cover [Fig. 03] illustrates that these items are not destined for the rubbish dump; rather, they can become new clothes to be worn again. The article on “The End of Trash” (Gambi, 2020; Goldberg, 2020; Kunzig, 2020) presents Prato as one of the capitals of the world’s circular economy. In February 2016, a group of companies in the Prato district decided to join the Greenpeace Detox<sup>7</sup> commitments.

1 Associazione per il tessile Riciclato: <https://astrireycling.it/en/astri-recycling-2/>.

2 Textile Exchange – retrieved from <https://www.solomodasostenibile.it/2020/07/24/la-moda-il-riciclo-e-leconomia-circolare/>.

3 Cardato and Cardato Regenerated CO2 Neutral brand: <http://www.cardato.it/en/en-home/>.

4 <https://www.solomodasostenibile.it>

5 <https://www.texmodatessuti.com/sostenibilita/tiziano-guardini-texmoda-tessuti/>

6 <https://www.wearglobalnetwork.com/news/winner-of-green-carpet-fashion-award-2017-designer-tiziano-guardini-selects-new-concept-by-santoni-fulgar-as-key-accessory-for-his-collection/>

7 About Detox: <https://www.oeko-tex.com/en/our-standards/oeko-tex-detox-to-zero>

## The Transformations in Fashion Design Practices: New Research Perspectives

Within the framework this article offers about the contemporary relationship between fashion design processes and the manufacturing system, in the light of the New European Bauhaus principles empowered by digitalization, the debate unravels in multiple directions for research and practice. The creative and cultural dimension of the fashion industry shows the research silos that keep fashion studies and fashion design research separate, limiting a richer conversation about the role of fashion as cultural and political agent. As Fiorani (2006: 7-8) stated, fashion is “(...) the mold of the contemporary culture, in its ability to join the dynamics between individual and society. (...) Fashion is the most complete expression of a post-modern industrial culture (...)”. In its identity-making dimension and because of the cultural embodiment process it materializes and promotes, fashion acts in the creation of a cultural phenomenology (Csordas, 1999) where the embodied experiences we live and the multiple cultural meanings we experience intersect. Fashion becomes a political agent when carrying meanings and messages (Calefato, 2021) and thereby allows the reappropriation of roles and spaces. Therefore, it becomes a driver of responsible choices of designers, brands, manufacturers, governments, consumers, and citizens at large as well. In fact, the role of fashion is shaped in the relationship between the meanings embodied in the products and the nature of processes that generate those products. As Manzini (2022) suggested about fashion becoming an agent of regeneration, and therefore a political actor, fashion needs to redefine the meaning of newness, diversity, care, and therefore quality. Paolo Franzo in his article “Fashion as a Practice of care” moves from this premise and the concept of futuring (Fry, 2009) and fashion futuring (Payne 2019; Vaccari & Vanni, 2020) to discuss the agency of fashion. He discusses the construction of relationalities through fashion production, and the promotion of civic and environmental activism supporting the idea of fashion predesign practices as socio-cultural driver for the enhancement of territorial specificities and traditional crafting practices. Martina Motta discusses the social impact of the political agency of fashion in detail in the case of the Psycoknit research project, which focuses on overcoming the post-pandemic emotional

fear of touching through knitwear practices. In Motta’s discourse, the dialectical relation between individual and communities in their being in time and space is key, and fashion design has the potential to lose the traditional connotation of industry and become associated with awareness, self-support, empowerment, and individual representation.

The concept of futuring and reflecting on practices to design futures connects also to the need to develop plural perspectives. The work of Rodriguez-Schon and Colombi discusses the AI-empowered trend practice in fashion. They comment on the ethical implications of AI in relation to the creation of biased knowledge and inequalities due to the lack of diverse representation, the lack of neutrality in the information generated, and the lack responsibility for the use of data.

The creation of alternative stories about fashion and alternative imageries is further explored by Davalli within the theoretical framework of *The Pleasure of Text* by Roland Barthes. In particular, in “Meaty Mags and Fleshy Films: Observing the Morphing Body of Text In Fashion Visual Culture”, Davalli discusses the relation between written texts in the fashion communication and the visual fashion culture that is created as a result of complex metaphorical and semantic processes where media and tools are reinterpreted.

Filieri, Benelli and Filippi bring the discourse even further, reflecting on the relationship between Fashion and Art, very often debated by scholars. They highlight how Fashion acts in the engagement of the consumers and question about its real ability to be inclusive, sustainable and equal.

Discussion on the role of fashion designers is more relevant than ever. While Franzo highlights the social and civic connections between the designers and the territory intended as a complex reservoir of knowledge, competences, and relations, Faerm proposes the idea of the “Designer-As-Social Scientist”, stressing the need for a holistic approach to consumers’ needs and questioning the traditional fashion design process’ fit in the contemporary world. The discourse on the epistemological dimension of design and the role of designers started with the first edition of Herbert Simon’s (1969) *The Sciences of the Artificial*, then updated in the 1981 and 1996 editions. This idea has been explored by other scholars such as Schön (1983) and Cross (2001), among the many. It reverberates now in Faerm’s article and also in the manuscripts of Denaro, Bortolotti, Quartu



Fig 01

and Giraldi. The three authors contextualize this discourse in relation to the digital transformation of fashion. Denaro discusses the competencies and skills required within a 4.0 fashion industry, where digital competencies need to be integrated with soft skills beyond disciplinary boundaries. Bortolotti zooms in to read the identity and role of artisanship in the 4.0 paradigm, especially in the Italian manufacturing landscape, where advanced and digital technologies can empower an “artisanal intelligence” that can be the real engine toward the 5.0 paradigm. Quartu’s work explores a project of digitalization of fabrics from historical archives and explore their application in interactive digital environments. The research opens new perspectives for innovation in textiles and fashion design, with the potential for immersive phygital experiences and digital archives for fragile artifacts. Giraldi closes the circle of thoughts, analyzing the opportunities offered by the metaverse. The real impact of the Metaverse in the fashion industry is currently under discussion so we ask ourselves: What is fashion in the metaverse? If fashion is not just an industry based on designing, producing, and selling garments and accessories, how can the metaverse streamline fashion’s political, cultural,

and social roles and objectives? What is the object of such fashion?

Coppola’s article also tackles a renovated approach to fashion, starting from the environmental needs posed by overproduction and overconsumption in an attempt to change the narrative and the perceived value of waste in the traditional fashion process.

The aforementioned research perspectives are reflected also in current debate on fashion education (Bertola, 2018; Bertola & Colombi, 2021), where the shift to an open, accessible, non-disciplinary knowledge is asking for new educational models. Morea’s work can be seen as part of this discourse as it presents a toolkit to integrating sustainability assessment as a constitutive component of the fashion design practice and therefore of fashion design education. Traditional tools, such fashion libraries, see their identity and role renewed because of the relationship with the digital realm, as Trame explains in her manuscript. In fact, the expansion of the concept of libraries and their practices in the digital age highlights the need to reconsider the nature of these institutions and the accessibility of fashion documentation. Lo Savio discusses the incorporation of artificial intelligence

equipping creative individuals with tools that can assist them in tasks such as collection management, trend interpretation, cataloguing, and reduction of material waste. By conducting a thorough analysis, he assesses several cases where AI is employed in fashion design, exploring its role in either collaborating with or substituting the fashion designer.

Finally, Sbordone recalls fundamental questions in regard to the relationship between the design and creative culture and the quality of fashion, to the expression of the self in the digital era, to the belonging to a context, being it digital or natural, and to the reconstruction of the connection between those two dimensions.

This overview updates streams traditionally debated by scholars, but it highlights the urgency of building virtuous relationships between industry and civil society in search of a responsible and sustainable system. The perspectives offered by the articles included in this issue question the fashion status quo and our understanding of fashion not only as an industry but as a socio-cultural and political agent. Finally, they stimulate further investigations in order to capture the everchanging redefinition of fashion in light of the contemporary challenges and opportunities we are facing as a society.

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#### Figure Captions

Table 01: Operationalization Table. Source: Teece (2017)

Fig. 01: Cardato Regenerated CO<sub>2</sub>Neutral, Samples. Source: Texmoda

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# ESSAYS

# FASHION AS A PRACTICE OF CARE

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## Abstract

The contribution questions the possibility that fashion and its objects can be interpreted as a practice of care, agents capable of stimulating a positive change in the relationship between people, environment and territories. Within the theoretical framework of fashion futuring, the design and social innovation workshop Talking Hands is analysed as a case study of redirection practices, which are expressed in participatory design dynamics, relationships between the subjects of creative and production processes, new narratives and synergies between people and communities.

**Keywords:** Care, Fashion Futuring, Participatory Design, Relationships, Territory

## Theoretical Framework

In 2022, the design theorist Ezio Manzini published an essay in which he questions – and questions us – on the possibility that fashion and its objects can become agents for positive change, to reweave the web of life which, in recent years, we have so recklessly torn apart (Manzini, 2022). Manzini's reflection is part of that emerging strand of thought that no longer limits itself to investigating how fashion can diminish its negative impact on the environment and on people (Fletcher, 2010; Tham, 2012), but instead tries to understand how it can produce a positive effect on the present and the future. This perspective introduces the concept of care as an element to be placed at the centre of reflections on contemporary fashion and its necessary reorientation (The Care Collective, 2020). The idea of care is understood here, according to the reading provided by Joan Tronto (2013), as an action to maintain, continue and repair our world. Manzini's focus on fashion objects as positive agents of change is an evolution, on the one hand, of the critique developed by Mol, Moser and Pols (2010) on the fact that care is often mistakenly distinguished from artefacts, which are considered

apersonal and “cold” in comparison to the intimacy assumed in care; on the other, of the theories on the new materialism elaborated by Anneke Smelik (2018) in the context of fashion studies, which are contributing to bringing matter and bodily experience in its weaving interconnections with the world back to the centre of the debate.

In recent years, the idea of the future and its very existence are at the centre of theoretical reflections in design and fashion. Relevant in this sense is the contribution of Tony Fry (2014), who elaborated the concept of “futuring” to define a new design approach capable of providing new trajectories and redirection practices in relation to environmental, economic, and social issues. In this framework, design is considered as the catalyst for change, because of its influence and relevance to economy, industry, technology, ecology, culture, community, territory. It has the task of considering and promoting the concept of “sustain-ability”, which includes the actions and skills to materially sustain life, cultures, ideas, imaginaries, environment, people. These are redirection practices, able to change paradigms and outline new scenarios. Futuring has recently been introduced in fashion studies (Payne 2019; Vaccari and Vanni, 2020;

Franzo 2020a), with the aim of interpreting emerging phenomena in this field and overcoming dualisms: between sustainable and unsustainable, material and immaterial, local and global. Fashion futuring, as well as its initial elaboration in the field of design, is relevant because it recognises the designer's ability and responsibility to act on the present, modifying current processes and ensuring the possibility of a future. It is therefore an act of care, returning to Manzini, that urgently requires a different approach to fashion design and production.

Within this theoretical framework, therefore, the contribution analyses a case study in Italy, Talking Hands, with the aim of verifying the thesis that fashion can be a practice of care and a positive agent for the environment and people. The analysis of this single case study, a fashion and design brand, can help to define an innovative model to be reproduced in other contexts in order to support the future of Made in Italy (Morelli & Sbordone, 2018; Franzo, 2020b). The decision to work with this case study derives from its uniqueness in Italy, since no other similar examples in terms of design approach, participatory dynamics and creative melting pot emerged during the desk research. In fact, the focus

of these projects is often mainly oriented towards the social implications and design is reduced to almost only a pretext; the case identified, on the other hand, is characterised as an example of contemporary fashion design, which feeds on the different individual cultural experiences. Through an interview carried out in February 2021 with Fabrizio Urettini, the founder of Talking Hands, useful information emerged to outline an innovative model for fashion design and new roles for the people involved, providing answers on the hypothesis that fashion is a practice of care in a futuring perspective.

### A Case Study of Participatory Design

Talking Hands is a permanent design and social innovation workshop, founded in 2016 in the small town of Treviso in the Veneto region. The project is run by a group of refugees and asylum seekers, mainly from sub-Saharan Africa, engaged in several activities, including design, production, and distribution of a collection of clothes and accessories. The managers of the fashion workshop are two young people from Gambia, with previous



Fig. 01



Fig. 02

experience in tailoring in their country of origin. Italian designers, students, activists, teachers, and photographers also collaborate on the project; people – both volunteers and migrants – contribute for a limited period, then leave space for others to arrive and collaborate, depending on their time, experience and goals.

Each project developed by Talking Hands is the result of a small creative and production chain, involving people with different degrees of experience and skills, supporting an improvement of competences in different disciplinary fields. The process of value creation is thus entrusted to individuals, the creative community and the social network (Meroni, 2007: 182). This case study was identified because it innovatively combines cultural capital, technical skills, and different approaches to design and manufacturing.

What emerges prominently from the case analysis is the participatory dimension of the project that occurs at every stage of the creative and production process. The selection of fabrics is the first moment of exchange between the different people involved in the development of the collections. Lanificio Paoletti in Follina, near Treviso, joined the project, providing its own fabrics, which were left over

from warehouses that could not be sold due to their scarce footage; the decision to use waste material is positioned in a vision of environmental sustainability, contributing to the poetics of the project (Binotto & Payne, 2017). Lanificio Paoletti is significant in this collaboration because it stands out for its continuous search for connections with territory, designers and artists, promoting awareness of contemporary issues. One example is the annual event *La Via della Lana*, during which the factory opens its spaces to the public, transforming itself into a temporary incubator where exhibitions and seminars are held (Franzo & Moradei, 2021). Talking Hands and the collaboration with Paoletti were presented in this event, helping to disseminate the value and research that characterise the project [Fig. 01].

The analysis of Talking Hands shows that an initial selection of materials to be used for the garment is made by a textile designer, who assesses their technical characteristics according to the type of garments to be made. The final choice, also motivated by colours, textures and textile designs, is made by the different people involved; in some cases fabrics are combined with each other as a patchwork and the combination is decided by the

young Africans. Italian fabrics are also combined with cottons with colourful Wax prints, typical of the countries of origin of the refugees involved in Talking Hands. The fabrics, therefore, already express the meeting of different ideas, sensitivities, visions, and cultures.

The design phases present similar dynamics of collaboration between the various subjects, each free to propose and develop their own ideas, which are then evaluated by the group. The development of the patterns takes place under the guidance of a pattern-making teacher from whom the migrants learn rules and techniques; but, at the same time, they are free to experiment and develop ideas by working directly with the materials, by hand or

by machine, without first defining the pattern, which is produced later. In this case, an approach to fashion design based on fabric manipulation and moulage techniques is adopted, i.e. as it is usually done in their places of origin. Two different approaches to the creative process thus intertwine and contribute to the growth of the project [Fig. 02]. The video and photo shoots involve the people who designed and made the garments, making them wear the garments and posing both inside the tailoring workshop and in other contexts. The images often show several people holding hands, emphasising the collaborative and participatory spirit of the project [Fig. 03]. Even the moment of sale involves the various protagonists of the project, through participation in markets, fairs, temporary exhibitions; in this way a direct contact is established with the client and his feelings, the project goes beyond the spatial delimitation of the tailor's workshop and extends to the community. A fashion project such as Talking Hands, therefore, becomes a place for sharing values, ideas and knowledge; everyone brings their experience, makes it available to others, participates in a common goal, and leaves traces of themselves even after they have left and made room for others. They take care of each other, their specificities and interests.

### Relationships and Territories

The case analysed is a useful example of how it is possible to create new networks of relationships within a community through design (Montanari & Mizzau, 2016). It promotes synergies with local companies and it is open to the territory, especially in a city – Treviso – where the migration issue is often at the centre of political, cultural and social confrontation (Moretti, 2019). It should also be remembered that the province of Treviso was for decades an important industrial district of the fashion system, but in recent years it has suffered a severe crisis in terms of employment and turnover and it is looking for a new identity.

This phenomenon is part of the interest in the Italian province that has been emerging in recent years, both by researchers who are investigating its peculiarities and by brands and companies that choose to relate to this territorial dimension (Manfredi, 2019; Vaccari & Franzo, 2022). The experiences that arise and develop in the Italian provinces are increasingly significant for their ability to be local but, at the same time, become a



Fig. 03



potential model on a national scale. In this sense, Talking Hands, while relating to a specific territory, can provide the tools for new relations with different contexts.

This project is able to combine the cultural capital of a territory, welcoming people of different nationalities, experiences, cultures and goals in the same place (Conti & Panagiotidou, 2020). It becomes an attraction for professionals and companies in the surrounding area, who decide to make their materials, time and skills available. Even more significant, however, is the opposite movement: the idea of getting refugees out, asking them to cross the city, to be among people, to establish new relationships. Fabrizio Urettini, in fact, decided to start home deliveries, bringing the young people and the objects they created, often very colourful, into the centre of Treviso. In the interview he observed that this moment seems to turn into a parade, attracting attention, some laughter, but also many conversations: “the relational bridges we so desperately wanted to build”. The analysis of this phenomenon finds a valid support in the words of Morelli and Sbordone, who state that “social cooperation, aimed at local development, makes its action on the territory

explicit through a dense network of material and immaterial relations between people with different skills, degrees of knowledge, and the places deputed as centres of productive and cultural activities” (Morelli & Sbordone, 2018, p. 178).

A further initiative aimed at acting in the territory is the decision to move the embroidery workshop to a public park for an entire summer. As Urettini recounts, once a week the migrants worked outdoors, on concrete ping-pong tables [Fig. 04]. The handicraft work turned into a relational device able to activate social transformations and foster participants’ self-esteem, attracting the attention of the people present in the park, fascinated by the display of embroidery and crochet skills (Gauntlett, 2011; Hackney 2013). There were exchanges of opinions, discussions about techniques and a natural involvement of the community; embroidering outdoors, in a group, in a public place, is a clear action of craftivism, a movement that activates elements of solidarity, anti-capitalism and environmentalism through craft and manual practices (Greer, 2014).

The desire to be visible, to show one’s image, leads back to the idea of futuring according to which the designers are tasked with developing



Fig. 04

powerful narratives, visions of the future or the ‘not yet’, amplifying and connecting grassroots efforts undertaken by local communities and organisations (Manzini, 2015). Talking Hands already declares in its name the intention to be a place of storytelling, encouraging participants to use design and manual activity to tell their biographies, places of origin, experiences, goals. These voices overlap and combine to define an original and unique story, based on diversity. On the website, all the participants in the project are presented without hierarchy, narrating a community that relates and participates in the same objective. Roles are not defined, the traditional figures of the creative and productive process of fashion are no longer recognisable, including the designer who is transformed into a collective identity. In Talking Hands the whole group collaborates together in the phases of material selection, design, pattern development, tailoring and sales, under the coordination of several guides. This case study demonstrates what Manzini (2015) argues, namely that in the 21st century an ‘expert’ design is emerging, which is proposed as a set of skills, sensibilities and cultural tools, stimulating and supporting wider and more articulated co-design processes. The awareness of a new model of relations emerges from Urettini’s words: “We believed it was important for the working group to be accompanied by professionals for various reasons [...]. For us, it is of fundamental importance to create opportunities for horizontal dialogue and to operate in a transcultural context without losing sight of the objective of making the most of the different players involved with our projects and to re-imagine the material world through a synthesis of the applied arts”. Talking Hands is therefore an example of the potential of recognising the most promising social dynamics and working with them, of connecting the human capital of a place to develop a narrative through a design project.

## Conclusions

The contribution aimed to demonstrate how the experience of this unique case study, interpretable as an example of futuring, can be scaled up and replicated in other contexts, becoming a virtuous model capable of sharing values, ideas and knowledge. Fashion design has the potential to be a practice through which to care for people and the environment. It represents an opportunity to

create new relationships within a community and to enhance the cultural capital of a territory. It should be emphasised that this case study is not so much a model because of its economic or industrial size, but because of its innovative cultural and social approach through fashion design. Objects play a decisive role in countering dominant visions, developing a culture of diversity and a more inclusive society. Design is the tool through which to plan and create relational networks that form new communities, synergies with local businesses and interactions with the territory.

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## Figure Captions

Fig. 01: Presentation of Mixité collection during the 2019 edition of La Via della Lana event, at Lanificio Paoletti in Follina, Treviso. Ph: Francesco de Luca.

Fig. 02: Fabric cutting phase. Ph: Francesco de Luca.

Fig. 03: Mixité Collection, 2019. Ph: Francesco de Luca.

Fig. 04: Embroidery activities by Talking Hands collaborators at the public park in Treviso. Ph: Francesco de Luca.

# UPSKILLING FUTURE WORKERS IN THE FASHION SECTOR

## AN EDUCATIONAL TOOLKIT FOR SUSTAINABILITY ASSESSMENT

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## Abstract

The European Commission within the Strategy for Sustainable and Circular Textiles cited circular business model solutions and ecodesign strategies as paramount for the sustainability of the textile sector. Nevertheless, how can sustainability knowledge be transmitted to the constellation of SMEs? The Eu Act for skills identified a gap between the knowledge currently owned by companies and the skills required for the green transition. The research investigated the possibilities of conducting the upskilling by integrating the Life Cycle Design approach within fashion design education. A toolkit has been developed for the qualitative and quantitative assessment of eco-design strategies in which Life Cycle Assessment analysis has a keyrole. The toolkit validation took place through a set of intensive workshops and a structured course, involving around 400 students at university level. Finally, the brands involved have enthusiastically greeted the effectiveness of students' outcomes.

**Keywords:** Education toolkit, SME Upskilling, Sustainable Fashion, Life Cycle Design, LCA

## Introduction

The production and consumption of textile products continue to grow and so does their impact on climate, on water and energy consumption, and on the environment. Global textiles production almost doubled between 2000 and 2015<sup>1</sup>, and the consumption of clothing and footwear is expected to increase by 63% by 2030<sup>2</sup>.

In the EU, the consumption of textiles, most of which are imported, now accounts on average for the fourth highest negative impact on the environment and on climate change, and third highest for water and land use from a global life cycle perspective (EEA, 2022).

These negative impacts have their roots in the linear economic model, and Fast fashion is one of the most shocking examples. Fast fashion is the phenomenon of enticing consumers to keep

on buying clothing of inferior quality and lower prices, produced rapidly, causing overproduction and overconsumption. To the environmental issue is added the social issue. The main apparel industry, driven by pressures to minimize production costs to meet consumer demand for affordable products, is currently facing worrying child labour and gender equality issues. As women make up the majority of the low-wage and unskilled textile workforce (ILO, 2016), improving the sustainability of the supply chain has also an important cultural dimension. The European Strategy for fashion (EC,2022) declare that advancing towards sustainability of the textiles ecosystem requires deep changes in the currently prevailing linear way in which textile products are designed, produced, used and discarded, together with reducing its impacts on climate change, unsustainable resource use and environmental pollution, and halting the violation of human rights in the textile value chains. Areas such as eco-design, fibre development, innovative textile production, repair and reuse service are judged as particularly important by the European Commission to maintain competitiveness of European companies in the global market.

The Strategy for a Sustainable and Circular Textile

<sup>1</sup> Ellen MacArthur Foundation (EMF) (2017) <https://ellenmacarthurfoundation.org/a-new-textiles-economy>

<sup>2</sup> European Environment Agency (EEA) (2019) Textiles and the environment in a circular economy

(EC 2022) proposes actions for the entire lifecycle of textiles products while supporting the ecosystem in the green and digital transitions. It addresses the way textiles are designed and consumed, including looking at sustainable technological solutions and innovative business models.

However, the textile sector struggles to attract qualified young talents. SMEs in the textiles ecosystem are being held back by a lack of skilled employees who can enable the changes. 40% of European companies reported a green skills gap (Euratex, 2021)<sup>3</sup>.

77% of European companies reported difficulties in finding workers with the necessary skills (Eu Year of Skills 2023)<sup>4</sup>. Under the EU Pact for skills the Commission (EC, 2020). supported the establishment of a large-scale skills partnership for the textiles ecosystem to promote upskilling, reskilling and the acquisition and transfer of green and digital skills, including knowledge on life cycle assessment and value chain assessment.

Vocational education and training, both initial and continuous, including apprenticeships, are essential for equipping people with the necessary skills.

From the Design Council's Report 2021 Beyond Net Zero: A Systemic Design Approach, most designers are still not fully using their skills and knowledge to support the transition to sustainability. There are still many designers who are not sufficiently aware of sustainability issues and continue to create harmful product-services. At the same time, many designers are working superficially without addressing the underlying issues. From the interviews conducted in the report, it is the designers themselves who report as a limitation the inappropriate knowledge of the tools and approaches needed to design for sustainability.

Andrews (2015) points out that to achieve a radical shift in design thinking in line with sustainable thinking, it must be essential to integrate within Design training academic curricula concepts related to Sustainable Development. The designers have the opportunity to lead the new paradigm through design and communication tools.

This paper presents the intensive workshop What's inside? and the BA course Sustainability in Textile

and Fashion Products , as the results of the research that leads to the enlargement of educational offerings in design for sustainability.

### **Qualitative and Quantitative Assessment of Ecodesign Strategies**

Life Cycle Design (LCD) is a design approach that considers what the impacts might be at all stages of the life cycle of the product-service (Vezzoli & Sciama, 2006). The phases of a product-service system life cycle have been identified by the ISO 14000 standard itself as: extraction, processing and production, transportation, use, and decommissioning. The phase of decommissioning, End-of-Life (EoL), should be understood as the phase in which a new cycle could be born for the system under analysis. Sustainable innovation possibilities can be implemented in each phase with different strategies; moreover, several strategies can be combined simultaneously to achieve more effective solutions. To eco-design it is important to compare the strategies proposed in relation with the context. Strategies should be assessed and then quantified in environmental and social impacts. The Life Cycle Design approach uses both qualitative and quantitative tools to evaluate the opportunities from the design strategies. Life Cycle Assessment analysis is therefore used in conjunction with the LCD approach to verify the improvements achieved with the strategies (Bretz et al., 2001).

The Strategy-Wheel is a visual representation to frame strengths and weaknesses regarding a given issue; the axes represent design requirements that are given a score. The EcoDesign Strategy Wheel (Brezet & Van Hemel, 1997) is a qualitative tool and is a variation of this diagram that arranges on the axes as evaluation parameters the phases of the life cycle of a product-service system, and associates with each phase the possible strategies for sustainable implementation in that specific phase. A total of eight strategies are identified: development of new concepts, selection of low-impact materials, reduction of material use, optimization of production techniques, optimization of the distribution system, reduction of impact during use, optimization of initial life span, and optimization of the end-of-life system.

Life Cycle Assessment (LCA) is a well-defined method to calculate the environmental burden of a product or service. However, LCA has been made so complex that it seems to be a job for specialists

<sup>3</sup> <https://euratex.eu/news/which-skills-companies-need-from-their-workforce/>

<sup>4</sup> [https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/european-year-skills-2023\\_en](https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/european-year-skills-2023_en)

only. The specialists jargon ('functional unit', 'fate analysis', 'midpoints', 'endpoints', 'attribitional modelling', etc.) makes it even more impossible for non-specialists to find out what they need to know to make an LCA (Vogtländer, 2012). Designers should be able to develop these analyses in autonomy during the design process, however LCA seems more a complication that is left at the end of production processes. Professor Joost Vogtländer has identified two main criticisms in using LCA methodology during the design process: lack of time to dedicate at the assessment of each strategy investigated, and lack of money to invest in software, people and time - to make an LCA requires a lot of time (at least 2-3 month). For these reasons, he has written the guide "LCA. A practical guide for students, designers and business manager" and he has developed Idemat, a fast-track app for LCA.

The aim is to assist users that are not so much interested in all the ins and outs of LCA but that just want to have quantitative guidance in the decisions they have to take. Users are identified as:

students, designers, business managers, consultants in the field of business strategy, product innovation, or in the field of government advice. Users do not want to spend much time on LCA, since their primary task is the introduction of innovative products and services. Users often have no dedicated computer software, no licenses on LCI databases, and no budget available for specialized LCA consultant firms. They want to do it themselves, but the time they can spend on the issue is limited. They are not interested in formalities and deliberations on accuracy: they just are interested in results (Vogtländer, 2012).

The LCA. A practical guide for students, designers and business manager (Vogtländer, 2012) is in compliance with the ISO 14040 and 14044, as well as the formal LCA manual of the ILCD of the EU. The Idemat app, on IOS and Android, is a tool that allows designers to compare materials and derived processes based on environmental impact. The IDEMAT dataset (made available by the Delft University of Technology at [www.ecocostvalue.com](http://www.ecocostvalue.com)) is a set of Life Cycle Inventories (LCI) of more than

LCA PHASE	EDUCATIONAL OBJECTIVE	TOOL
1° Goal and scope definition	Learn to identify the supply chain system, through info graphing that makes it easier to read the processes involved. Define the boundaries of the analyzed system.	Circular Design Guide: - Product journey Mapping
2° Life Cycle Inventory	Know how to search for detailed information related to materials and processes within the system boundary.	Circular Design Guide: - Smart material Choices
3° Life cycle Inventory Assessment	Know how to manage data collection from the database, including as a result of the absence of certain entries and their replacement or removal from the analyzed system.	IDEMAT app o excel sheet
4° Interpretation	Know how to read indicator values. Know how to identify items with environmental criticality and set up the search for an alternative solution.	Eco-strategy Wheel

Table 01

1200 materials, services, production processes and end-of-life scenarios. The accessible nature of the app makes it highly useful in the early stages of the design process. The impact data included in this app is licensed under CC BY-4.0 (see creativecommons.org) and is therefore free to use in all projects (even commercial) as long as both the creator and Delft University of Technology are attributed Idemat data are available for Simapro as well as Open LCA.

### Toolkit to Integrate Sustainability Assessment in Fashion Design Education

The aim of this research has been to upskill

education in textile and fashion design with eco-design knowledge. The method used has been to give the students a toolkit for both qualitative and quantitative assessment, and enable them to interact with specialists of the supply chain. The research then led to the development of two educational formats: an intensive workshop and course both at university level, with the topic the application of LCD and LCA approach and tool for the redesign.

For both the cases, the aim is to let students practice on one hand with the individuation, the assessment and the communication of supply chain hotspots, and on the other hand with the proposition of more sustainable strategies.

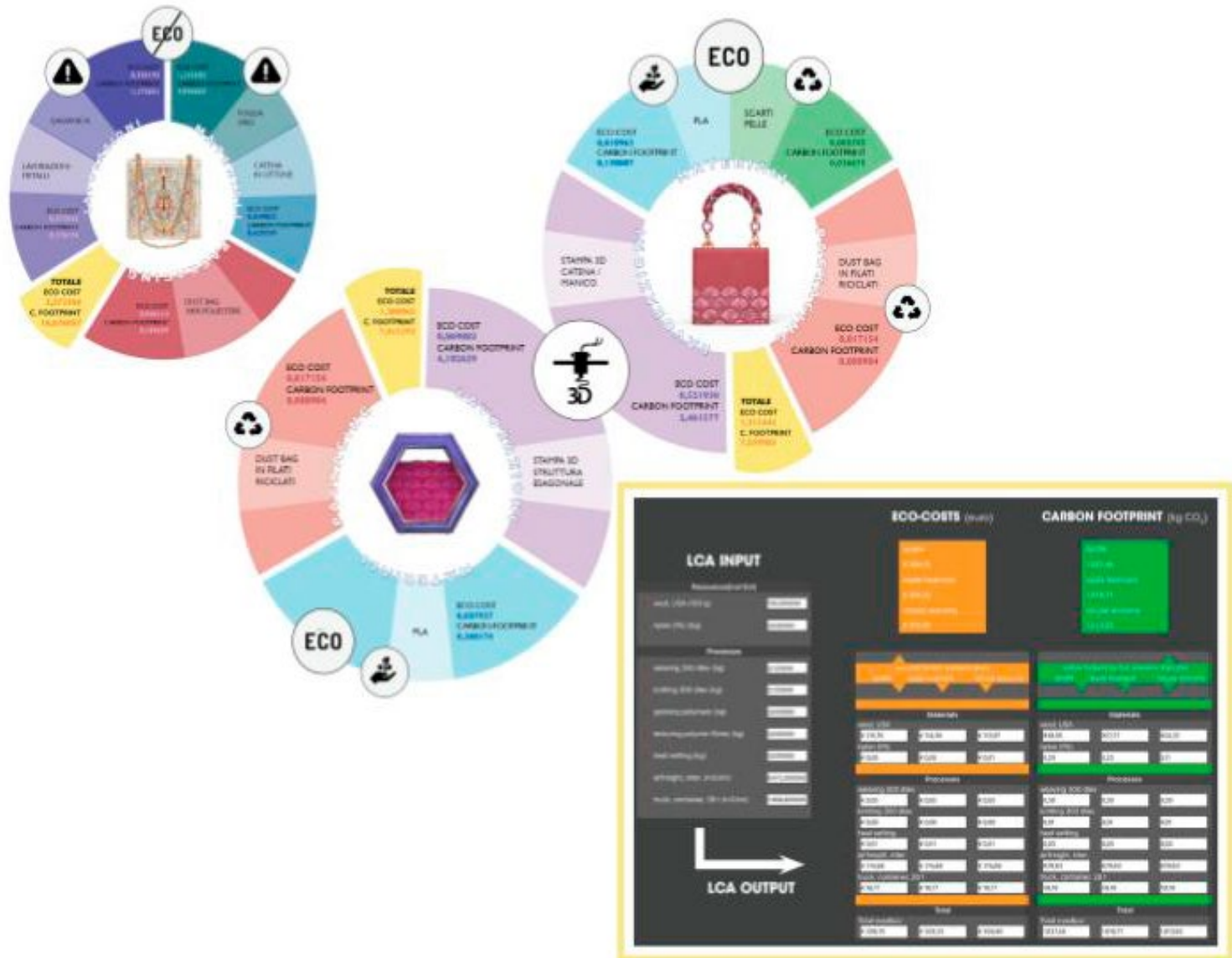


Fig. 01



The intensive workshop has been built on the structure of LCA analysis required by the ISO 14040. Specifically, each phase was assigned a training objective (see table on previous page). The LCA methodology according to the ISO standard is introduced and applied to real cases brought by the students, mainly everyday objects or clothing, through the use of the Idemat database. The supply-chain mapping of the individual product case-studies is carried out by the students following the two worksheets developed by the Ellen MacArthur Foundation in collaboration with the design firm IDEO, within the Circular Design Guide. With the starting point that through proper visual representation of the system's inventory to analyse, it will be easy to define the boundaries of the analysis system, and manage the inventory of necessary data, collected data, and missing data. In particular the tool Smart material Choices - Understand the breakdown of materials that go into your product and Product Journey Mapping - Ensure your product is in a useful state for as long as possible were used to cover the first and second phases of ISO 14040 - Scope & goal Definition, and Life Cycle Inventory LCI.

The third phase, the Life Cycle Inventory Assessment (LCIA) is conducted through Idemat. Students are asked to download the database from <https://www.ecocostsvalue.com/data/> or use the smartphone application and search for the items included in their system's inventory. The fourth phase, data interpretation, is proposed in the workshop as the redesign of the product analyzed using the Eco-strategy Wheel. Students are asked to identify the critical values that emerged from the analysis, and to look for alternative solutions which could be already on the market or not. New design strategies can be investigated, which will be verified again through LCA analysis, and then a comparison between the two analyses will be conducted.

The task of the course is to introduce supply chain complexity and prepare for the LCA analysis. The assignments aim to highlight the importance of the mapping phase of the system to analyze and the interpretation and redesign phase.

Proper graphical representation of the supply chain, with all its processes, and clear mapping of input and output flows significantly facilitate the conduction of the environmental and social assessment. A correct mapping facilitates the collection and management of data, but also helps in the definition of the boundaries of the LCA



Fig. 02

analysis required by the ISO 14040 standard. Appropriate visualization helps the communication of analysis results within the company, facilitating discussion of strategies to apply or not. Data mapping is thus framed as a strategic tool for the designer and the commissioning company, both to facilitate understanding of systems and redesign strategies and to communicate value through traceability and transparency. Usually, however, the graphic representation of the supply chain is relegated to the interface of calculation software such as Gabi or Simapro, with the sole purpose of setting up the calculation problem, without enhancing its communicative opportunities.

### Toolkit Validation through the Two Educational Formats

The first format was the intensive workshop, named 'What's Inside?', with the intended to recall the exploratory action that is put in place during an LCA analysis. The workshop was offered between the years 2020-2022, involving about 100 students in different training contexts: the School of Architecture University of Florence (UNIFI), the Ecole Euro-Mediterranean d'Architecture, Design et Urbanisme (EMADU) of the UEMF Fes- Morocco, the Amsterdam Fashion Institute (AMFI) HvA, and an IFTS technical-scientific training course of the Tuscany Region.

Regarding the assignments related to systems mapping, the student outcomes varied widely in relation to the educational background of each class. however in each case the assignment was achieved and then understanding of supply chain complexity, as well as the issues of processes and materials. Students showed a high enthusiasm in the possibility of actually quantifying sustainability and they were gratified by the simplification achieved with the use of the Idemat phone app [Fig. 01]. A wider range of outcomes has been noticed for the strategies originalities proposed for redesign the products.

The brands, when involved, have remarked a great interest in the graphical representation of production processes, for the communication of the value chain involved in the product [Fig. 02] . Finally two main reactions from the students were noted. On the one hand there was considerable enthusiasm in being able to achieve the 'truth' about sustainability. nevertheless, on the other hand there was also the perception of a certain complexity of the systems to be analyzed and the variables present, which sometimes led to a feeling of frustration.

The second format for the validation has been the course "Sustainability in Textile and fashion Products" that took place during the academic year 2022-2023 involving about 300 students from the first year of the BA Degree in Textile and Fashion Design (UNIFI). Students were asked to choose a

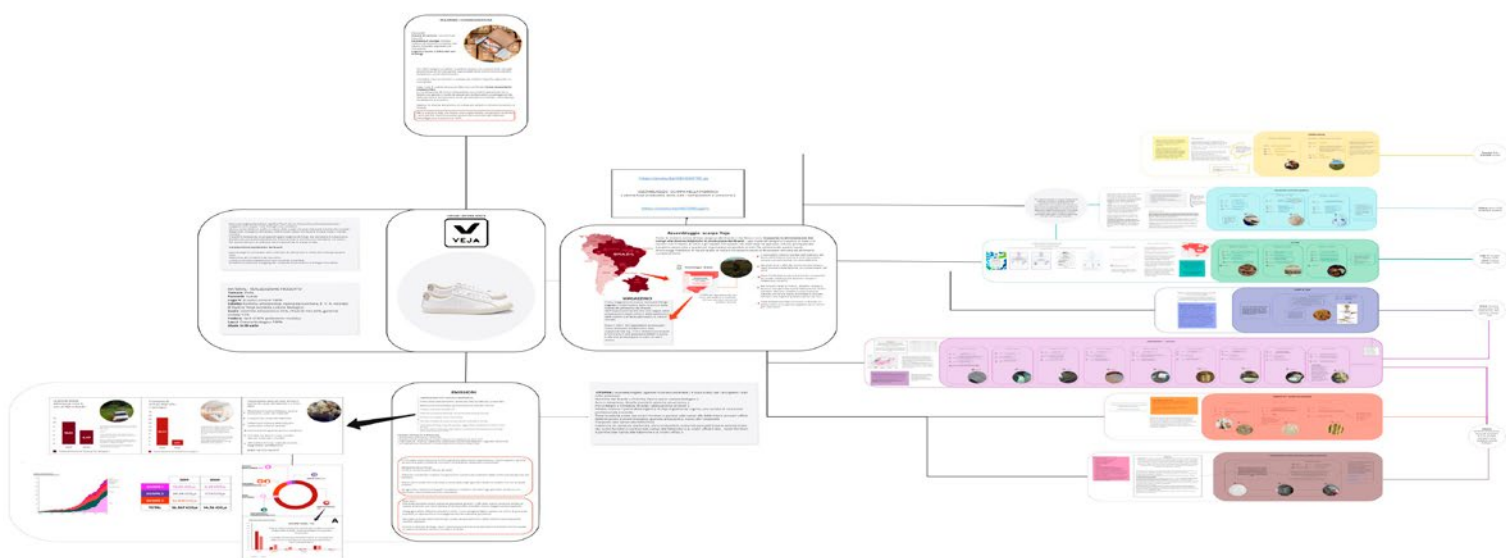


Fig. 03



Fig. 04

product and in a first phase to perform a supply chain analysis [Fig. 03] , and subsequently to use the Eco-strategy Wheel to redesign the product [Fig. 04]. Using Miroboard as support, students reconstructed the product supply chain from cradle-to-sale, seeking information from company websites and literature about materials and production processes. The results are visual mappings that unravel complexities of each component's production processes, and highlight the environmental and social hotspot referred to as input and output of all the processes. In the second phase, students were asked to assess the present product following the strategies displayed by the Eco-strategy Wheel and then redesign the product improving the social and environmental aspects. The product's supply chain was reconstructed by all the students but with a wide range of depth. Most students carried out an accurate investigation of data, by literature and by getting in touch with companies. However students have shown some difficulties in managing the lack of data and in the differentiation

of greenwashing from real data. At the same time, students have shown interest in investigating criticism linked to process, materials and logistics. The efficacy of graphic representation proves successful comprehension and handling of information.

When the students have involved the brands of the product analyzed to show the supply-chain representation and make propositions, the brand has shown enthusiasm in developing a dialogue based on a graphic support. The output made by the students results as a facilitator for the dialogue between the actors in the supply chains, resulting in a broadening of the discourse.

### Conclusion

It turns out to be increasingly necessary to increase corporate competitiveness in the area of sustainability and to prepare designers working in SMEs to manage sustainability within companies so that they can liaise with other experts and various

suppliers. Together Life Cycle Design approach and Life Cycle Assessment are the base to root sustainable decisions in the design process. The research addresses the need identified by the European Commission for upskilling the future workers in order to achieve the green transition. Within the case of the textile and fashion industry, this need translates into the dissemination of eco-design practice and knowledge at different professions of the sectors. The research aims to help train a professional figure in the fashion sector who must reconcile both knowledge related to design and production processes and knowledge about quantifying environmental impacts, so as to facilitate redesign and collaboration with experts such as chemists and environmental engineers. The toolkit proposed within the workshops and the university course, provides participants with a toolkit for assessment of product sustainability. Although complex methodologies as LCA have been introduced, students demonstrated an understanding of the possibilities of using them in the ecodesign context. The dialogue that took place with the brand involved, confirmed the achievement of the goal to upskill the students and make them more competitive in the job market, thanks to making them conscious of their design actions. The overall goal is to broaden the educational offerings, increasing students' skills by providing them with the skills to apply the Life Cycle Assessment methodology to their projects, and to be able to collaborate in obtaining certifications from companies both in terms of traceability and transparency. The shift toward a more sustainable fashion, wished by Europe and its citizens, can be achieved only with a spread of sustainability assessment knowledge at different levels with different complexity. In this work we tried to tradeoff between analysis complexity and analysis ease, in order to bridge the gap with skills needed by companies. The road ahead seems to still be long, but we hope that more effort is drawn in the direction of sustainable change both from the educational institutions side and the SMEs side.

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#### Figure Captions

Table. 01: Intensive workshop framework based on LCA analysis structure, with educational objectives description and tools used.  
 Fig. 01: Students' coursework. What's Inside? Workshop. Example of LCA analysis of a fashion product carried out on the Idemat app. Source: author  
 Fig. 02: Students' coursework. What's Inside? Workshop. Examples of web communication of the production process and value chain of the Replica bag. Source: author  
 Fig. 03: Student's coursework. Course in Sustainability in textile and fashion product. Example of Supply Chain Mapping of Vaia pair of shoes, inventory of materials and process involved. Source: author  
 Fig. 04: Student's coursework. Course in Sustainability in textile and fashion product. Example of Eco-Strategy Wheel application to redesign a fashion product. Source: author

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# BEYOND THE AESTHETE

## TRANSFORMING THE ROLE OF THE FASHION DESIGNER IN AN EMERGENT SOCIAL CONSTRUCT

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## Abstract

The role of the fashion designer must transform. The fashion marketplace has reached unprecedented levels of abundance, thus altering society's relationship with design. Consumers' basic needs are over-met and have surpassed the material realm; consumers are increasingly driven by their search for emotional fulfillment via design. This emerging behavior is pivoting the perception of design "value" from the tangible to the intangible. While traditional values of function and aesthetics remain fundamental, a design's capacity to deliver "emotional value" to consumers must become the focus of design practice. This requires a transformation of the designer's traditional role. Rather than creating from myopic biases, they must research consumers' psychographics to "design emotion." This new role—the "Designer-As-Social Scientist"—takes a holistic view of consumers' needs. The designer's transformed role will result in products having greater emotional value, enhanced product sustainability, and businesses increasing consumer loyalty and resultant sales by offering only those products that are truly desired by their target audience.

**Keywords:** Fashion Design, Generation Z, Fashion System, Consumer Behavior, Sustainability

## Introduction

The traditional role of the fashion designer is no longer relevant or sustainable. As the contemporary fashion marketplace reaches unprecedented levels of abundance and consumption, consumers' needs and desires for design move well beyond the material realm. Thus, fashion designers can no longer maintain a singular focus on producing objects that offer conventional forms of value (e.g. material worth and function). Designers must now incorporate "emotional value" into their creations that targets consumers' unique practical and emotional needs.

This new practice requires the fashion designer's role to transform. The conventional and outmoded "designer-as-auteur" who espouses personal preferences and dictates to consumers must be replaced by designers who, through their use of advance research processes grounded in the social sciences, offer emotionally compelling products that provide emotional value to their audience. The very design process itself must shift: rather than creating designs from myopic, personal biases, designers must begin creative ventures by researching their consumers' psychographics and

emotional needs. This research will substantiate their creations, thereby yielding greater emotional value increasingly sought by consumers.

The need to transform the designer's role is due in part to society's changing relationship with design. In the 21st century, design has become a near-obsession for consumers who want greater accessibility to "high design" products. In response, retailers develop collaborations with extolled "guest star" designers, including Versace for H&M and Missoni for Target. Consumers purchase these unprecedented levels of merchandise, causing fashion brands to respond with correspondingly extreme levels of production.

Consequently, a new relationship has emerged between design and consumer. When viewed through Maslow's Hierarchy of Needs (1943), the overabundance that characterizes first-world societies enables people to have their basic needs met and search for meaningful life experiences and emotional fulfillment. This search for meaning generates the increasing importance that emotionally compelling narratives have in oversaturated markets where consumers are inundated with offerings. Rather than seeking design that merely offers traditional, tangible value

(function and aesthetics), consumers seek products that provide “emotional value” that fulfills their increasingly complex and nuanced emotional needs. This deeper form of value leads people to cherish their goods longer, thus supporting sustainability. To succeed, fashion designers must adopt a new role—the “Designer-As-Social Scientist.” In this advanced role, designers will transform their traditional design processes into a new framework that generates detailed research to illuminate consumers’ specific needs for emotional fulfillment. This data underpins all proceeding stages of design—from design concept to final product to presentation format(s). This new role also results in products having greater meaning and emotional value; designers standing out in the over-saturated market; enhanced sustainability; and businesses increasing resultant sales by offering products that are truly desired by their audience.

### **The Contemporary Fashion System**

At the advent of the 21st century, a watershed moment occurred when consumers’ interests in “designed” objects evolved into a near-obsession. Aesthetics became more pervasive across demographics and lifestyles, no matter their member’s social, economic, or professional affiliations. Consumers’ growing interest in “high design”—design that is commonly perceived as “cutting edge” and typically created by an acclaimed designer or brand—became especially piqued. This rising attention to and resultant sales in high design are attributed to the ubiquity of the internet that promoted higher standards of choice and aestheticism among consumers, increase of marketing campaigns that promoted conspicuous consumption, growing affluence, and emergent technologies that facilitated hyper-accelerated and less expensive production output. For the average middle-class consumer, homes could now be filled with high design—no matter how pedestrian or utilitarian the object—such as the Target housewares collection designed by the internationally extolled architect Michael Graves. The sudden, meteoric enthusiasm for design has also led fashion to proliferate. Partnerships between mass-retailers and world-famous designers have gained especially high levels of fervor and resultant sales revenue. For instance, H&M has produced over twenty five collaborations with design luminaries that include Karl Lagerfeld and

Lanvin. When the retailer unveiled its collaboration with Balmain, nearly 500 shoppers slept outside H&M’s London store the night before the opening. Similar fervor has been experienced across diverse public platforms. The television show Project Runway’s US syndicate grew 150% in just four seasons and has aired 25 versions internationally (Givhan, 2014). The Metropolitan Museum of Art’s (MMA) exhibition “Heavenly Bodies,” a display of religious-inspired fashion, attracted more than 1.65 million visitors, making it the most visited exhibit in the museum’s 150-year history (MMA, n.d.). The exhibition’s “conversation” between tangible objects and intangible beliefs and feelings underscored design’s ability to surpass mere aesthetics and functionality and deliver emotional fulfillment to broad audiences.

Consumers’ growing obsession for fashion has led the industry to swell. Fashion has grown from a \$500 billion trade to a \$2.4 trillion a year global behemoth in just 30 years (Thomas, 2019). Accordingly, the number of employees in the textile, clothing and footwear industry increased 275% in just 14 years, from 20 million in 2000 to approximately 75 million by 2014 (Duke, 2017). Today, the global fashion value chain—from designers to distributors to retailers—employs well over 300 million people (Ellen MacArthur Foundation, 2017).

The increasing attention to fashion across consumer demographics and the attendant spike in the fashion industry’s growth have directly contributed to an unyielding amount of apparel production and consumption. For example, the number of garments produced annually has doubled since 2000 and exceeded 100 billion for the first time in 2014 (Remy, Speelman, and Swartz, 2016). Thus, factories produce exorbitant volumes of low-cost “high design” goods that perpetually entice consumers to buy things more often, consequently creating record levels of consumption. Today’s consumers purchase five times more clothing than they did in 1980 for a worldwide total of 80 billion apparel items annually (Thomas, 2019).

Amid this unrelenting production and consumption is the ever-quickening lifespan of garments. The average consumer will wear a garment just seven or eight times before it is discarded—or, keeping garments half as long as they did just fifteen years ago (Remy, Speelman, & Swartz, 2016; Thomas, 2019). In the UK, 9,513 clothing items are discarded every five minutes and, globally, of the more than 100 billion items of clothing produced each year, 20% go unsold (Thomas, 2019).



### The Resulting Emotional Effect

The fashion industry's hyper-accelerated model of "take, make, dispose" has consequently produced a sea change in how the contemporary consumer understands—and relates to—fashion. Designed products become mere objects that provide an immediate sense of reward through the act of selecting, purchasing, and owning them. Design moves between the states of usefulness and garbage at hyper-speed; this rapid lifecycle decreases the sentimental value placed on items by consumers. Apparel quickly becomes "stuff" or a "thing" with no meaning, no emotional value. The approach to fast fashion and its attendant global economies of scale amplifies this expedited lifecycle and reduced emotional value due to its propagation of homogeneous design that, in turn, fails to address fully consumers' specific aesthetic and/or emotional needs. Such failings to address consumers' distinct personal needs in the immediate future could create dire consequences for fashion brands: in one recent survey, 80% of respondents stated they are more likely to do business with a company that offers personalization while another 52% said they would switch brands if they aren't getting a personalized experience (Baird, 2018).

### The Emerging Consumer Generation

Commonly known as "Generation Z," today's young adults are the largest generation in history. Born between 1997 and 2012 and representing 40% of the world's consumers, they exhibit specific attributes and needs that have been shaped by the world in which they have developed as both children and emerging adults. They will therefore greatly impact how the fashion industries evolve and how brands target the attributes of these emergent consumers. While a growing body of research literature reveals extensive shared interests and associated consumer behaviors that are common to "Gen Z," this study summarizes three themes that are especially salient to the future fashion industry: Corporate Responsibility, Social Justice, and Emotional Wellness. Together, these themes illustrate how Gen Z consumers use consumption as a way to communicate their values and beliefs for a better world, and by doing so, will transform the meaning and function of design in society—and the role of the future fashion designer.

### Corporate Responsibility

As the fashion industry's catastrophes and nefarious acts—including the Rana Plaza apparel factory collapse and abundant allegations of forced labor in manufacturing—are exposed by the news media, consumers are increasingly scrutinizing their purchases to ensure ethical and sustainable practices have been followed. This scrutiny is especially high among Gen Z consumers: 45% always research for background information before buying, and 75% consider a trusted brand to be an important purchasing factor (Amed et al., 2018; Granskog et al., 2020). These world events and resulting sentiments are influencing Gen Z's consumer behaviors. A recent survey revealed: 90% of Gen Z respondents believe companies have a responsibility to address environmental and social issues, 66% are willing to pay more for sustainable goods, and nearly 40% want to know what goes into products and how they are made before they buy (Amed et al., 2018). Gen Z practices "conscience consumerism" by placing a greater value on brands that practice social responsibility, support underserved communities, promote environmental sustainability.

### Social Justice

Gen Z is more widely attentive to inclusion, diversity, social equity, and human rights than previous generations. Among young Americans, for instance, over 90% "strongly agree" or "somewhat agree" that gays/lesbians should have the legal right to adopt a child, nearly 60% believe forms/online profiles should include additional gender options, and 77% state a company's diversity would be a deciding factor on accepting a job offer (Stolzenberg et al., 2020; Parker & Igielnik, 2020; McGregor-Kerr, 2019). This generation's ethos is "we"-centered and one in which young peoples' concerns center around the well-being of everyone rather than just themselves. Such values are influencing Gen Z's attitudes towards consumption; its members are looking beyond tangible products and trying to understand brands' missions and purposes—and how brands contribute to a building a better society (Rahilly et al., 2020, n.p.).

Thus, a brand's practices—and not merely the physical products they offer—factor heavily into this demographic's purchasing decisions and brand loyalties. A recent survey of 2,000 consumers revealed two-thirds said they would switch, avoid, or boycott brands based on their stance on controversial issue (Amed et al., 2018). Another

survey of 16,000 participants showed 72% stated that the ability of a brand's values matching theirs is a deciding factor when shopping (Edelman, 2019). It therefore behooves fashion brands to become active leaders in promoting and advocating issues of social justice, thereby delivering the added emotional value increasingly sought by today's consumers.

### Emotional Wellness

Gen Z is growing up in a world filled with turmoil that has rarely been seen in the past. These young adults were born into a post-9/11 world, are witnessing escalating terrorism, use smartphones that facilitate near-constant communication with their parents and friends, and are observing unprecedented levels of societal/geo-political discord. These and other factors that are unique to this generation are instilling pronounced worry and fear among many young adults today. This is leading them to focus on and prioritize more acutely their physical and emotional safety and security. For instance, across US campuses, there has been a rise in disinviting (or attempting to disinvite) speakers whose topics or backgrounds are unsettling, challenging, or controversial to students: between 2006 and 2022, there was a 450% increase of attempted and completed disinvitations (6 and 33, respectively) (Foundation for Individual Rights in Education, 2023). The reasons for these incidents vary but, as Twenge (2017) asserts, “[m]any disinvitations are framed in terms of preserving the ‘health’ or ‘safety’ of students—usually not physical health or safety but emotional health or safety” (pp. 155–156).

Additionally, rising numbers of young Americans are choosing to delay significant life milestones that are typically associated with transitioning from adolescence to early adulthood. Instead of taking chances and facing challenges, these individuals are choosing options that offer more physical and emotional protection and comfort. For example, between 1989 and 2020, fewer US twelfth graders obtained a driver's license (down 29%), tried alcohol (down 34%), went on dates (down 25%), or had a paid job (down 33%) (Miech et al., 2021; Twenge & Park, 2019). Today's undergraduates (vs. students in the 1990s) “scored markedly higher on a measure of ‘maturity fears.’ [They] were more likely to agree ‘I wish that I could return to the [emotional] security of childhood’ and ‘The happiest time in life is when you are a child.’ They were less likely to agree ‘I would rather be an adult than a child’ and ‘I feel happy that I am not a child anymore’” (Twenge, 2017, p. 45).

Such aforesaid factors as these—which include excessive screen time and subsequent decrease of in-person socialization—are causing Gen Z to experience deteriorating emotional health like never before. For the first time ever, most undergraduates in 2016 rated their mental health as being “below average” (Twenge, 2017). In just nine years (2010–2019), there were increases in those “feeling things were hopeless” (up 27%), who “felt overwhelming anxiety” (up 42%), and who “felt so depressed that it was difficult to function” (up 60%) (American College Health Association, 2011; 2019).

### Design and “Emotional Value”

The contemporary oversaturated apparel market has resulted from consumers' exorbitant demands for high design and the subsequent spike in production and consumption. This oversaturation has spawned an environment of overabundance for consumers whose basic needs are not only met but grossly exceeded. Fashion brands must therefore distinguish their products in ways that surpass the traditional attributes of design (aesthetics and function) through the new attribute of “emotional value” in order to compete in the global fashion marketplace.

When more of our basic needs are met, “we increasingly expect sophisticated experiences that are emotionally satisfying and meaningful. These experiences will not be simple products. They will be complex combinations of products, services, spaces, and information” (Pink, 2005, p. 46). The theory of Maslow's Hierarchy of Needs (1943) (Figure 1) aligns with this assertion. Today's consumers climb from the pyramid's lower levels (where tangible necessities are located) toward its apex (where intangible emotional fulfillment is situated). This progression alters how consumers relate to design; their engagement with design is no longer driven by need but, rather, by the desire for emotional fulfillment that is gained through the design's uniquely compelling narratives. This does not imply that a design's core aims can (or should) be overlooked: it must work and elevate aesthetics. Rather, it means people increasingly seek emotional worth from design. As a result, crafting a compelling narrative that strategically delivers emotional value must be a driving force behind all future stages of design rather than a consequential effect of the product's final outcome. Moreover, given the aforementioned characteristics of today's

emergent Gen Z consumers who represent the largest consumer demographic today, it behooves fashion designers to reorient their practice as one that actively supports pressing social, personal, political, and environmental realities via their designs. [Fig. 01]

These factors necessitate a new role of the fashion designer, one that will transform into the advanced “Fashion Designer-As-Social Scientist.” To succeed in this new role, designers must be proficient in advanced research methods historically found in the social sciences, not design. Pragmatic social science methodologies must fuse with creative design processes, thereby creating a new framework in which designers comprehend the complexity of people, cultures, and belief systems that exist in

their target market, which may be different from the designer’s own myopic views. The outmoded “fashion-designer-as-auteur” whose subjective predispositions guided all design choices is replaced by progressive designers who incorporate objective data-driven research to gain findings for analysis that illuminate precisely what the designer’s audience truly wants and emotionally desires. In this regard, designers proactively and strategically contribute towards the “greater good” of society via products that aim to provide targeted emotional support and holistic personal wellness—an increasingly critical and beneficial role of the designer given the previously cited widespread decrease in people’s emotional health. When adopting this advanced research

## MASLOW’S HIERARCHY OF NEEDS

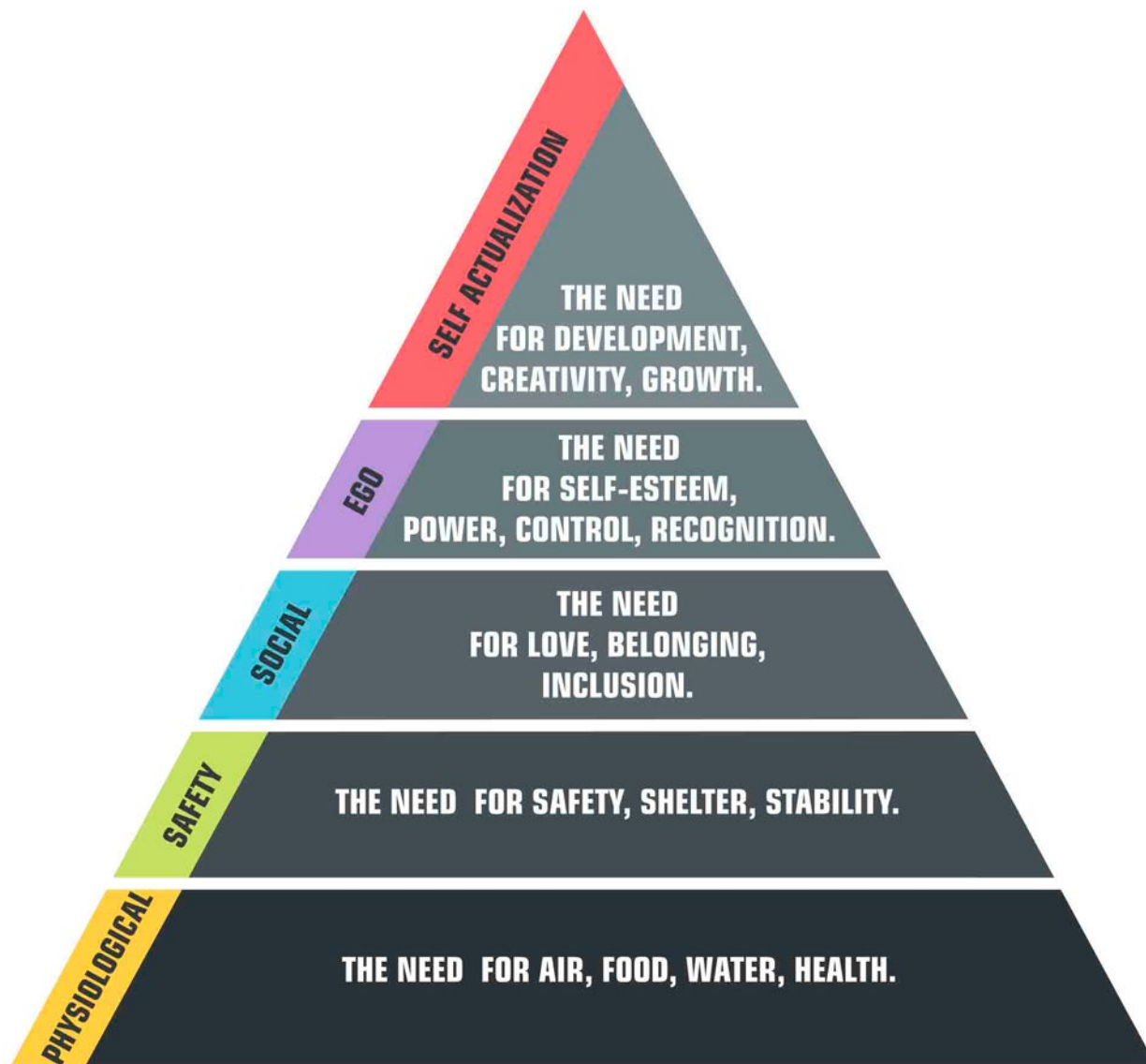


Fig. 01

methodology, fashion designers transform the conventional design process itself. Before starting any creative project, fashion designers must first develop a series of research questions that will ground the research process and provide the answers to questions that include: “What will be my customer’s emotional needs?”, “How can the products and/or experiences I design fulfill this identified emotional pleasure they desire?”, and “How can these products and/or experiences provide buyers lasting satisfaction?” When applying this new data, designers will be better positioned to determine which attributes their products and services will have. Designers will “design emotion” based on factual research data, strategically creating products and services that are imbued with stronger, more targeted narratives and emotional content. In turn, the designer’s standard competencies (such as creativity, contextualization, attention to detail, and the ability to see things in a different way) will be bolstered by additional competencies (such as ethnography, altruism, data analysis/synthesis, and empathy). As Gen Z consumers increasingly expecting brands to create products and services that respond to their

individual beliefs, values, and sense of self, this research framework, design processes, and added competencies will prime fashion designers for sustained success in the emergent fashion industry. By transforming the fashion designer’s role and creative practice, the fashion industry will no longer simply produce “stuff” that possess limited, fleeting emotional value but instead goods and services that deliver increasingly personalized, nuanced, and long-term emotional value and fulfillment required by Gen Z consumers.

### Recommendations

There are extensive methods to increase emotional value in fashion. Design customization and personalization are particularly advantageous for Gen Z “who no longer respond to being treated solely as consumers and, instead, seek to occupy the role of brand collaborators” (Lonergan, 2020, p. 110). Fashion brands are responding by providing co-design and customizable options for customers. For example, Nike and Coach allow shoppers to choose colorways and materials on numerous

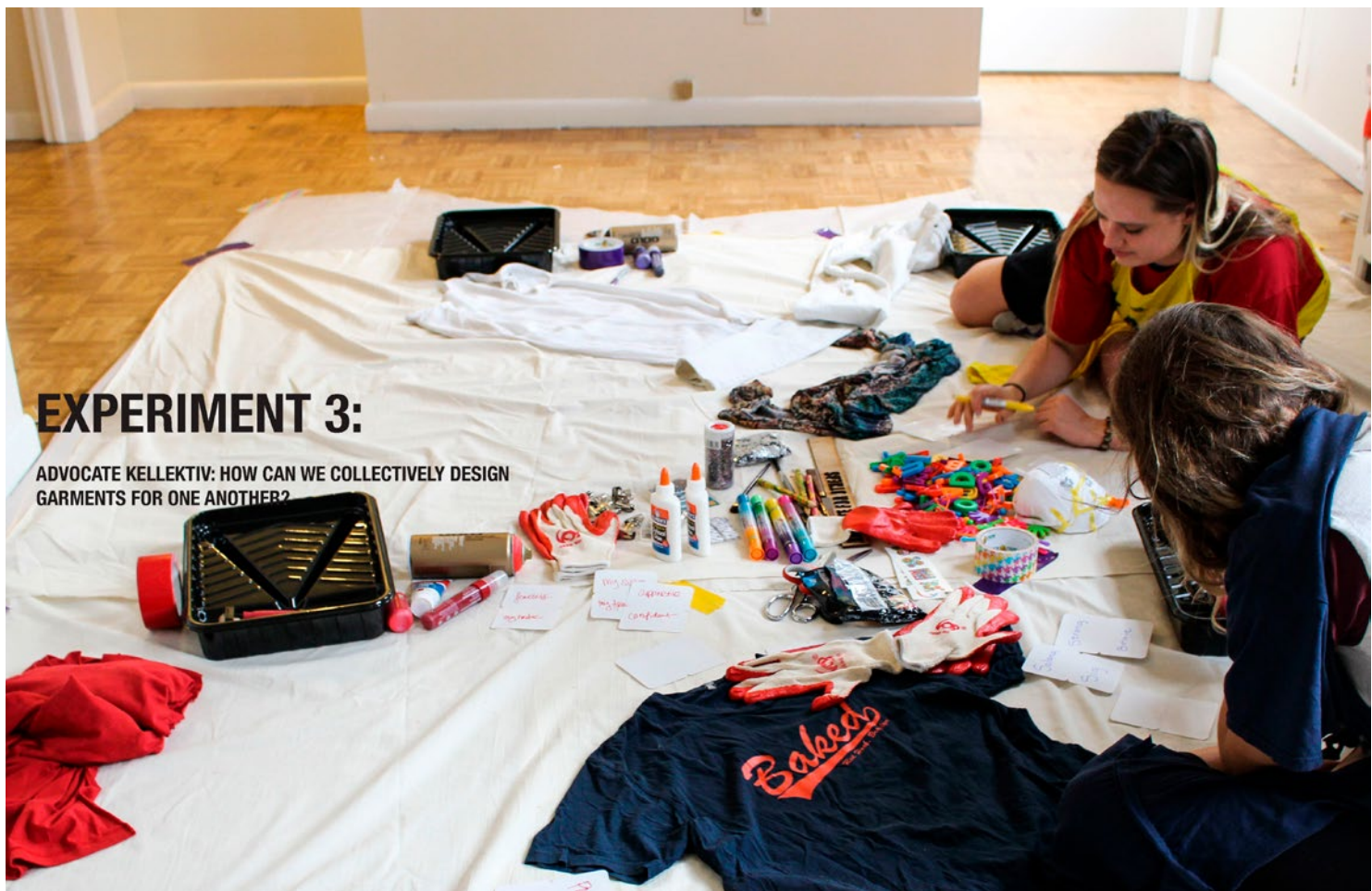


Fig. 02



Fig. 03

products. Personalized services are expected to become so commonplace that researchers speculate retailers will provide “smart” mirrors that will scan the shopper’s face and body to provide style recommendations. Consumers’ emotional needs are being met through these services, thus leading them to feel these personalized products are more significant representations of their individual identities. This, in turn, causes them to have a stronger emotional connection to their purchases, thereby extending a product’s lifespan and increase sustainability. [Fig. 02 – 04]

An exemplar of fashion design operating within this transformative fashion construct—The Designer-As-Social-Scientist—is The Kellektiv, a socially-oriented fashion system and collection created by Kendall Warson [Fig. 02–04]. Warson’s initiative aims to address, validate, and de-normalize stories of sexual assault and bodily harm amongst young women by inviting them to share their own experiences, unite as advocates for one another, and form meaningful connections through fashion. As part of the system’s design processes, participants donate apparel items that possess personal, symbolic meaning to them and, through upcycling and recycling, engage in co-design practices that reassemble and reimagine garments into modular, exchangeable components. Once completed, the garments are redistributed to the participants who then further personalize their garments/looks by rearranging layers, exchanging full or partial garments within the Kellektiv

community, and employing other methods for personalization. As Warson notes, “The system grows a collective consciousness and encourages collective advocacy in private and public spheres through the sharing, giving, exchanging, and reassembling of existing garments.” Warson’s work fulfills Gen Z’s distinct values, increasing needs for brands to address social issues, preferences for design personalization/customization, and greater needs for emotional value from fashion. Through these advanced processes of research and design, the designer’s role is transformed.

## Conclusion

While fashion designers of the 20th century created products in a smaller, more limited marketplace, designers of the 21st century operate within a hyper-accelerated global industry that over-meets consumers’ basic needs; this is altering society’s relationship with fashion. The consumer’s perception of design “value” has evolved from the mere tangible to the intangible. While the conventional principles of aesthetics and function remain essential components to design, designers must increasingly shift their attention to a product’s capacity to provide emotional value if they hope to attract customers and sustain consumer loyalty. This growing imperative has been influenced by a number of factors that include: the mass obsession

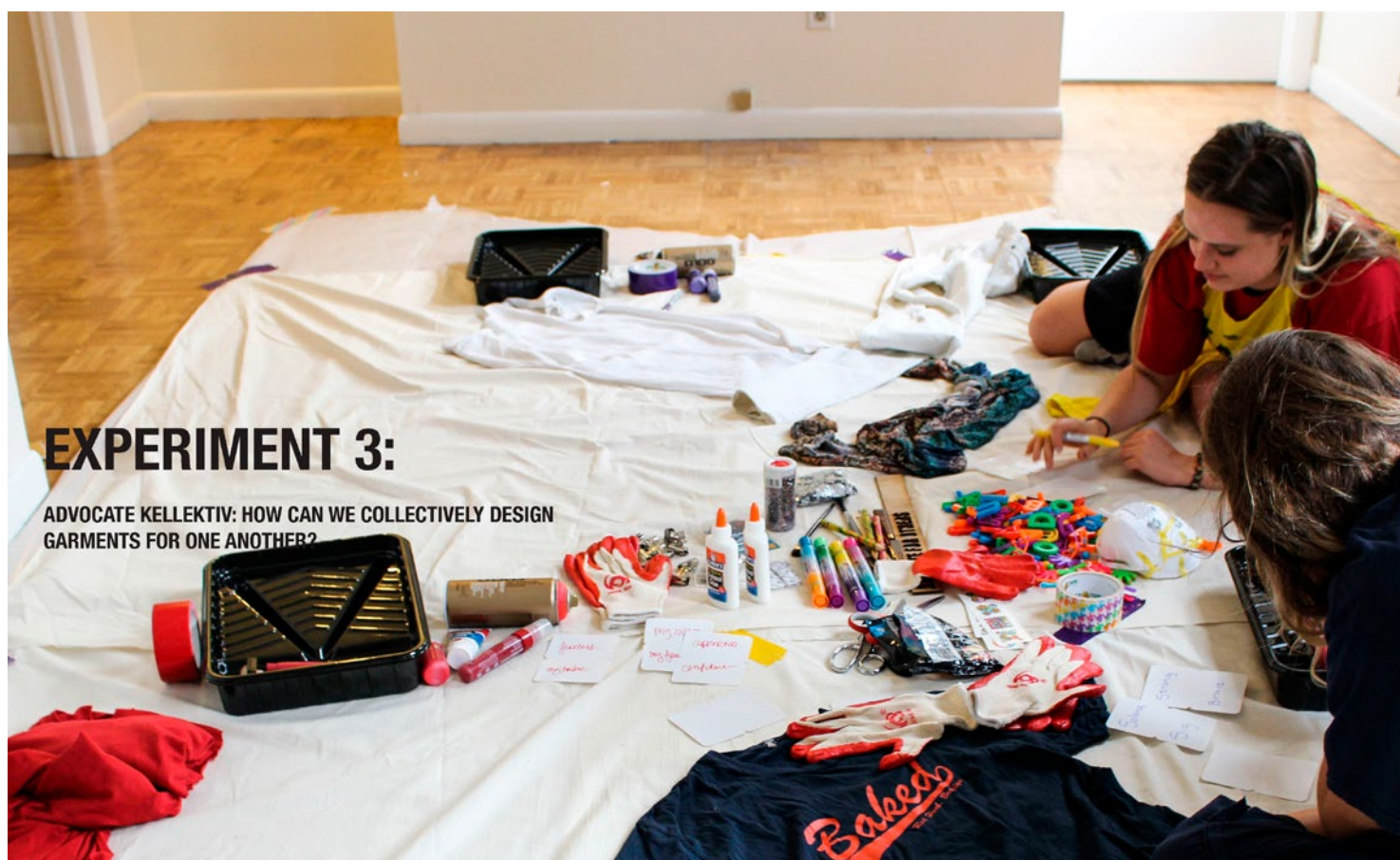


Fig. 04

with “high design”; the oversaturated marketplace in which designers struggle to stand out and capture consumers’ attention; and excessive rates of consumption fueled by affordable “high design” and consumers’ use of it for emotional fulfillment (i.e. Maslow’s Hierarchy of Needs).

These factors that are creating an increased demand for emotional value in design necessitates the new role of the “Designer-As-Social Scientist”—a fashion designer who understands better the psychosocial needs and wants of their audience so they may craft well-targeted emotionally compelling designs. Fashion designers must shift from their traditionally myopic design processes to those based in social sciences research methodologies that enable them to collect and analyze the actual emotional needs of their audience. In doing so, fashion brands gain detailed, factual understandings about consumers’ values, beliefs, and emotional needs, all of which increasingly influence their consumers’ behaviors. The attainment of this research is vital given the sizable population of Gen Z consumers who display markedly different attributes and needs from fashion products and brands than previous generations.

In many ways, design is a service to customers. When a designer’s work becomes informed by

the emotional needs of their audience, they will respond by crafting more enduring, sustainable designs. The role of creator (designer) and analyzer (social scientist) will synthesize as everyone engaged in the process of defining, planning, and designing fashion products and systems will be instrumental in the future of design. It is by doing so that the fashion designer and the fashion industry will remain successful and sustainable.

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## Figure Captions

Fig. 01: Maslow's Hierarchy of Needs Source: Shutterstock.com

Fig. 02: The Kellektiv, co-design initiative Source: Kendall Warson

Fig. 03: The Kellektiv, design process sample Source: Kendall Warson

Fig. 04: The Kellektiv, modular garment prototype Source: Kendall Warson

# ETHICAL IMPLICATIONS IN AI-POWERED TREND RESEARCH PLATFORMS

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## Abstract

The manuscript discusses the limitations of applying AI in trend research platforms for the fashion system. This analysis intends to take a position within the emergent research topic of AI. Considering its ethical implications, we explore the opportunities of implementing AI to support trend research from a design-oriented perspective, realising the relationship between fashion and trends, which is central in shaping the future. Examples of AI-powered trend platforms evidence how valuable their insights are for strategic innovation. The analysis focuses on platforms that provide tailored services using AI and expert interpretation. Virtue ethics of technology serves as a useful framework to examine this topic, proposing a new set of virtues that respond to technology's shaping of behaviour and its disadvantages. The risks of applying AI are many-fold; the consequences perpetuate power imbalances and social inequality. Proposing guidelines for enabling a responsible practice explores how to forge ethics into AI, creating a pluralised practice.

**Keywords:** AI, Pluralisation, Fashion, Ethics of Technology

## Introduction

The growing use of artificial intelligence (AI) powered platforms that offer a wide range of applications and services has fostered the development of new skills and tools. The popularity gained by GPT models that process natural language and AI systems<sup>1</sup> that create images (OpenAI, 2023) has exposed a variety of uses, from text-based answers to AI-generated art. This fast-growing technology fails to find a common consensus in its definition and regulation. The rise in its adoption is the result and cause of the development of innovative technologies used (and misused) among various disciplines and industries, such as fashion (O'Neill, 2016).

In particular, the use of AI in trend research—an activity particularly relevant for a futures-oriented practice as the fashion design one is and in which design and other futures-oriented disciplines find

a common interest (Poli, 2019; Celi & Colombi, 2017)—opens a new field of application, for which its implications shape our futures through the very design. The interpretations drawn from the trend research phase influence the design practice, where analysing trends from a prevailed perspective only, facilitated by the unregulated and biased use of AI, may determine a single-sided future.

Through an exploratory meta-study, this manuscript uncovers why understanding these implications, embedded in the use of AI-powered trend platforms, is key for the pluralisation of the fashion system. From the decolonial concept of Pluriverse (Escobar, 2018), pluralisation describes the coexistence of countless options of knowledge, being, and perception, critiquing the idea of universal norms (Tlostanova, 2017). The relevance behind the search for a pluralised fashion practice lies in fostering specific and intangible values that may transform the fashion system by defining its foundations. Involving historically marginalised voices and realising the culture of dress comprises multiple epistemologies promoting a richer practice (Jansen, 2020).

The ethical implications regarding the use of AI in trend research analysis will be discussed under the

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<sup>1</sup> Applications of AI or machine learning could be defined as "learning algorithms that manipulate and transform data into information suitable for the given task" (Mohamed et al., 2020).

parameters of technomoral virtues (Vallor, 2016), i.e., virtue ethics. Using these as a framework allows the introduction of values related to pluriversality, reflecting on today's prioritisation of capitalist canons that put hegemonical perspectives first, intending heteronormative, patriarchal, liberal views that flatten and homogenise results and experiences. The paper searches to analyse and take a position on the emerging issue of research on AI, realising that the advantages of using AI in trend research analysis are still subject to capitalist values that often bring detrimental implications to marginalised groups.

Virtue ethics also prioritises the coexistence of society and technology, evidencing the need to build contemporary virtues that "include an explicit conception of how to live well with technologies" (Vallor, 2016, p. 3). This is increasingly present in current debates regarding the role of AI, supporting the idea that it is a mere tool. Although the discussion around technological tools as means of control has been widely covered throughout history (Deleuze & Guattari, 1987; Foucault, 1988; Winner, 1980), the debate remains open into who handles the tool and how aiming at an efficient use and learning how to dominate it. It is then necessary for designers to maintain a critical stand and question these processes.

The research proposes a first set of possible guidelines ranging from practical actions and general leading values as conclusions, these are achieved by analysing the overlapping relationship between trends, the fashion system, their incidence on the future, and the use of AI technology, delving into its ethical effects. These are semi-outputs that result from a PhD research in design, where a first literature review contextualised the research, introducing the main concepts and principles. A further phase of desk research included the examination of case examples from various AI-powered trend research platforms. The paper is structured as follows: First, we will explore the overlapping between trend research, fashion, and futures in detail, setting the context. Second, we will analyse how AI-powered trend research platforms operate, reviewing upsides and challenges. Third, the ethical implications of AI and its consequences in trend research bring an overview of the specific effects, problems, and causes. Fourth, value ethics will be used as a framework to bring virtue ethics into technology, creating the bases for a theoretical and practical proposal. Last, the guidelines and the conclusions act not as an ending remark but as a critical debate.

## **Trend Research, Fashion and Futures**

The relationship between trend research, fashion, and the future is defined by the incidence one concept has upon the other. Trend research is the detection of anomalies and discontinuity in contemporary culture that indicate something is changing (Vejlgaard, 2008; Celi & Colombi, 2020). Its evolution through time is interpreted, understanding its new possible directions by detecting behavioural and habit changes and how these affect consumption. Designers identify new meanings in these findings through their reflective practice (Schon, 1983), generating multiple design trajectories (Celi & Colombi, 2020; Raymond, 2019). As outlined by Blaszczyk & Wubs (2018), fashion and trend forecasting have an intertwining relationship. The fashion system depends on gathering and distributing information about styles, fabrics, and colours. Initially, trend forecasting stood as colour forecasting; shade cards were created by French dye houses and sold globally; later, sample houses in Paris sold books with fabric swatches to designers, both serving as referrals on the desired French style for designers and textile companies. Nowadays, online portals share fashion predictions world-wide, guaranteeing immediate access to analysed information and valuable insights. The practice of fashion forecasting emerged as a need to reduce risks by predicting consumer patterns, an advantage numerous industries also leverage from.

Fashion's interpretation of the patterns of cultural meanings evidences how crucial it is for the design field to apply trend research (Colombi, 2011). The result of doing so is the envisioning of design scapes inspired by the context and the user's values. In fashion, trend books represent this context and its evolution, creating a desired design scenario and summarising qualitative research that includes codified and un-codified, tangible and intangible cultural sources not limited to specific industries, users, or locations (Colombi, 2011).

Fashion trends delve between a cultural and a commercial dimension as an instrument that incites consumption through obsolescence and innovation processes (Blaszczyk & Wubs, 2018). Although trend research analyses the cultural dimension qualitatively (Hesmondhalgh, 2007), some methodologies support themselves with quantitative tools to measure a product's perceptive characteristics or its performance on the market. Regardless of its highly intuitive feature, the

quantitative aspect is shown in annual or monthly reports that “offer almost real-time research updates” with valuable information for launching new products (Colombi & Zindato, 2019). The aim is to reduce the risks in “creative and economic investments” and facilitate the negotiation between its stakeholders, avoiding releasing an inefficient or outdated product (Colombi & Zindato, 2019). The application of trend research in design practices, including fashion, plays a crucial role in shaping the future. If we define designing “as the momentary coalescence of future possibilities materialised today” (Marenko & Brassett, 2015, p.6), then we may state that “[t]rends shape our futures, just as we shape trends” (Raymond, 2019:10). These are the core of the innovation and foresight process (Raymond, 2019). The interpretation of them by design practitioners makes evident the relationship between trends, design, and the creation of the future, where the role of trend research remains pivotal. [Fig. 1]

However, there are some liabilities in applying trends to define the industry’s future. Trends and their anticipatory feature, i.e., foresight<sup>2</sup>, lies at the intersection between trends and futures studies and is defined as a social construction, “[t]he future is built on the creation of knowledge and on the way

this knowledge guides everyday choices” (Fuller & Loogma, 2009). The influence of trends on how society constructs this knowledge risks becoming a self-fulfilled prophecy, conditioned by the need to keep up to date with trend predictions through innovation. As individual phenomena that helps predict a probable future, a trend might “constrain the analysis to phenomena already tracked in the past.” (Miller, 2006), leading to possibly repeat behaviours. When referring to a defined trend, it “is more likely to constrain than liberate exploratory thinking about the future” (Miller, 2006). Nevertheless, future studies use trend analysis to anticipate and create probable scenarios “meant to provoke imaginative thinking ... helps erasing prejudices and opening minds” (Miller, 2006), challenging current beliefs and assumptions. As one of the outcomes of a forecasting process in fashion design, the construction of scenarios ranges from visualisation to strategic planning by exploring alternative futures. Applying social and economic aspects enables forecasting and dealing with possible adversities, engaging stakeholders and influencing design decisions. (Colombi & Zindato, 2019).

### AI-Powered Trend Research Platforms

This section will focus on the quantitative support of data collected by AI models used by trend research platforms. For the past few years, numerous trend research consultant companies have paired machine learning with expert interpretation to understand society’s behaviours and consumption patterns (Powers, 2019). Combining quantitative and qualitative research methodologies renders the outcomes more relevant and robust, presenting themselves as safer bets when communicated to clients. Nevertheless, AI is not just a supporting tool that justifies the data; it also conducts and demonstrates these trends (Webb & Euchner, 2020). Its marketable characteristics attract investments for its development (Powers, 2019). The relevance gained by big data in the past decades came in hand with drawing valuable interpretations from it across all industries. Necessary for competitiveness in a capitalistic economy (Powers, 2019; Zuboff, 2019), the support of data not only refines given trends but also helps in decisions regarding retail, design, sales, and marketing (Holland & Jones, 2017). Trending algorithms

<sup>2</sup> By using insights from trends regarding demographics, lifestyles, and technology, foresight may reinterpret the industry’s norms creating competitive spaces (Colombi & Zindato, 2019).

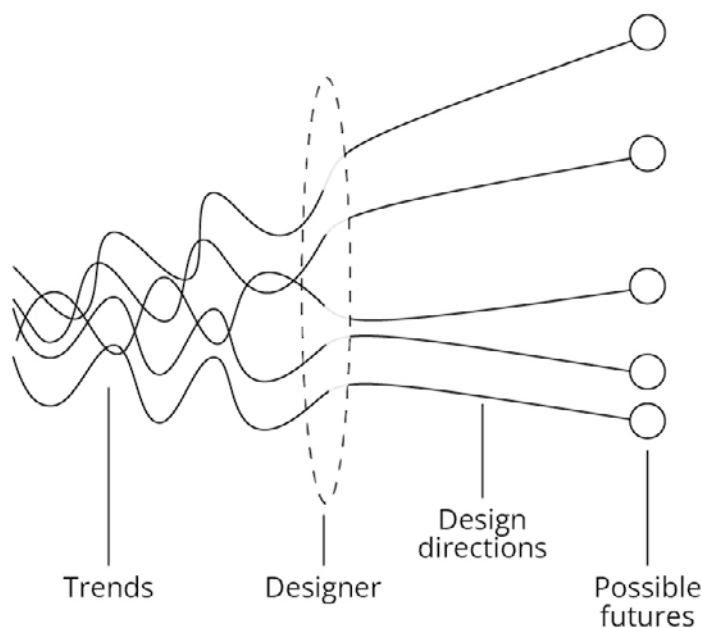


Fig. 01

concerning all sectors are available online in accessible platforms (IBM, Google, Statista, Twitter); they “select what to reveal and focus on, but also set up further decisions to be made on account of those actions, gathering more attention” (Powers, 2019, p. 26).

One of the precursors of qualitative analysis of fashion trends was Kawasaki’s Fashion Technology Group, which developed products based on statistical analysis (Blaszczyk & Wubs, 2018). A selection of data on “population structure, economic cycles, segments of specific targets, and past fashion patterns” (Donzé, 2018, p. 156) was processed using specific equations that gave a market-oriented perspective that understood customers’ needs and helped predict the future. Retail reports have appeared in newspapers in the past. Today, services like Edited (Edited, 2023) help companies in the fashion industry to adapt and plan according to the market’s state. This retail technology company shares global market data from over 12 years on stock levels, tracking over 5 billion products. Their AI engine “collects, categorises, and normalises all the market data”, providing analysis on “pricing, discounts, assortment, colors”, etc. (Edited, 2023).

There is limited scholarly research published regarding the use of AI in trend analysis for studying consumer behaviour. The consulting agencies that use AI provide some information, remaining opaque about how the algorithms operate, from where the data is being mined, what

samples are used, and what parameters are being analysed.

The predictions on consumer behaviours serve as valuable insight for innovation in any industry, launching new products or services, making strategic decisions, or understanding their customers. This presents a competitive advantage that comes in tailor-made reports or search engine platforms that map and interpret the data gathered. The qualitative interpretation of experts is fundamental to creating a differential value to what AI provides, a screening of the present context, and spotting’ weak signals<sup>3</sup> (Naisbitt, 1982) that may anticipate market shifts.

The functioning of these platforms does not differ much from what Rogers (2003) described in Diffusion of Innovations, where AI provides accuracy. The data is sourced from social media, e-commerce, online searches, user surveys, runway shows, retail information, etc. Machine learning, deep learning, mathematical vectors, and algorithms are some of the tools used to scrape relevant data using text or image analysis. Any kind of online trackable behaviour serves as data input for the algorithmic model, where products,

<sup>3</sup> Weak signs emerge as anomalies in the present context. These are observed by trend researchers as part of the initial cultural and social analysis that indicate the possible directions of change in behaviours and values. (Naisbitt, 1982)

UPSIDES	CHALLENGES
<ul style="list-style-type: none"> <li>• Provides analysed information and insights.</li> <li>• Reduces risks by predicting consumer patterns, avoiding releasing an inefficient product.</li> <li>• Facilitates the negotiation and engagement between stakeholders.</li> <li>• Anticipates probable scenarios that provoke thinking and envision alternatives to adversities.</li> <li>• Influences strategic planning and decision-making.</li> </ul>	<ul style="list-style-type: none"> <li>• Used as an instrument that incites consumption through obsolescence and innovation.</li> <li>• Their influence risks becoming a self-fulfilled prophecy, conditioned by the need to keep up to trend predictions.</li> <li>• Leads to the repeating of behaviours if constrained to the analysis of past phenomena.</li> <li>• A defined trend can limit the free exploration of the future.</li> </ul>

Table 01

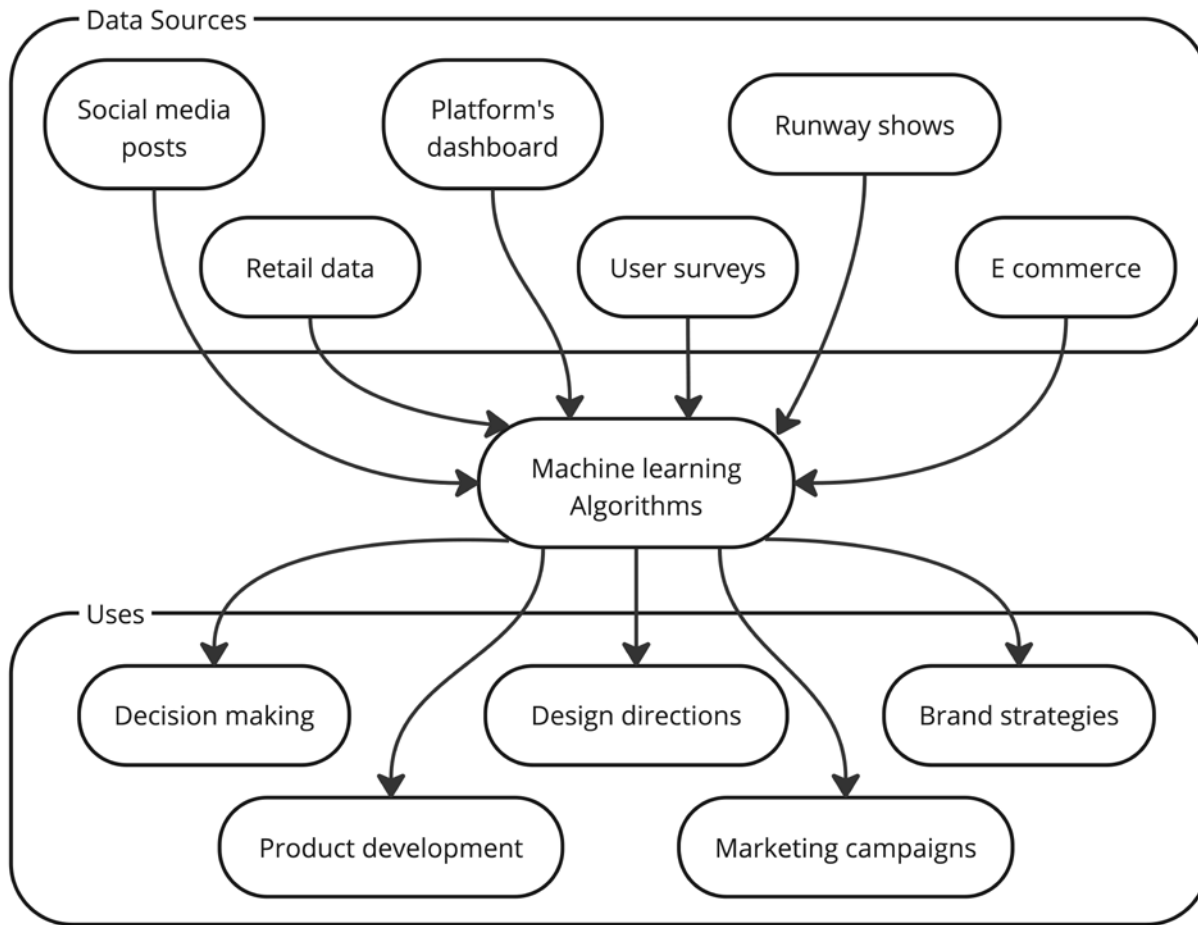


Fig. 02

the volume of searches, prices, quantities, styles, values, and any variable helpful in analysing and interpreting consumer trends are measured. An initial screening of many posts identifies early adopters and profiles of the first innovators and users that spark different behaviour. These relevant players and actors constitute the database for analysing published posts on social media or websites. Several hundred thousand users are screened; the findings, interpreted as weak signals, are translated into predictable consumer trends.

The platform itself is also a source of information; the search history from the dashboard (a database with all the curated content) is also analysed by AI. This is especially valuable in platforms with over 200 million users and over three years of experience. The connection between the keywords browsed and how deep the topic was studied brings added insights useful for more efficient identification of relevant information for their customers.

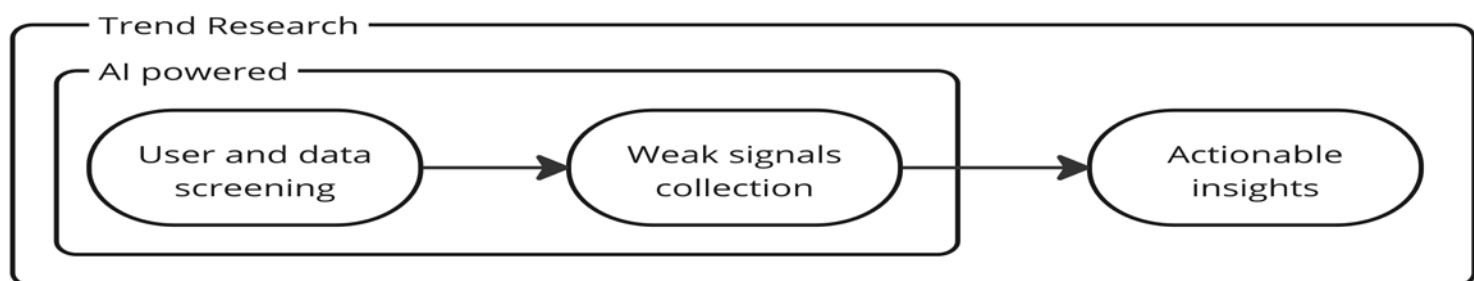


Fig. 03

## Ethical Implications in AI and the Consequences in Trend Research

Analysing the ethical implications involved in AI helps understand possible threats when applied to trend research. The issues outlined have been analysed as the problem, its cause, effects, and a proposal of potential solutions inspired by technomoral virtues. The problems and their causes can be categorised into four groups: the bias in the data sourcing, the embedded values and the bias of the person designing the algorithmic model, the misuse and bias of the users of the model, and the model’s opaqueness. In fact, we will discuss these issues’ effects and how they perpetuate social inequalities and power imbalances.

The upsides and downsides of AI are many-fold; analysing these under the lens of virtue ethics, we find that one of the main issues concerns that any mathematical model designed will inherently have the designer’s values embedded in it (Gebru, 2020; Joyce et al., 2021), but whose values are being represented? “[T]he lack of representation among those who have the power to build this technology has resulted in a power imbalance” (Gebru, 2020, p. 253). The dominance of the most powerful groups over marginalised ones results in systemic discrimination, reflected in what the technology can offer. “AI can obscure asymmetrical power relations in ways that make it difficult for advocates and concerned developers to meaningfully address during development.” (Mohamed et al., 2020, p.662).

The false conception of the neutrality of AI comes from the perception that the data used is representative and truthful without considering who and what it is representing. These assumptions

perpetuate the development of existing inequalities (Joyce et al., 2021). Machine Learning systems are trained with existing and real-time data to make automated decisions which are then integrated into the social world. The existing bias translated from its context to the algorithm is built into our social institutions; this hinders the nurturing of values like transparency and fairness, making it even harder for AI designers to frame them into the algorithms (Joyce et al., 2021). When trained on biased data representing inequalities, this model will exacerbate “existing societal issues driving further marginalisation” (Gebru, 2020:257). This perpetuates the status quo since the new data input “reinforces the bias creating a run-away feedback loop”<sup>4</sup> (Gebru, 2020:257).

The lack of legal regulations on AI (Luján Escalante et al., 2021) results in organisations keeping their mathematical models private, protecting their intellectual property and evading responsibility for their actions and outcomes (O’Neill, 2016). Many of these organisations claim instead that the users make their models racist or sexist (Joyce et al., 2021), ignoring the original virtues embedded in the design of these algorithms.

AI represents its surrounding context, embedded with the bias it entails (Mohamed et al., 2020).

<sup>4</sup> Such as the predictive policing model in the United States. Information on certain crime arrests is input in the model, although not all crimes committed are being reported, and the ones that are reported are performed by marginalised individuals. This leads to the increase of police presence in these neighborhoods, increasing the number of arrests there. The new arrests are input data to train the model, “increasing over-policing in disadvantaged neighborhoods and amplifying societal bias” (Gebru, 2020:257), falsely justifying their presence.

PROBLEMS	CAUSES	EFFECTS
<ul style="list-style-type: none"> <li>• Feedback loops.</li> <li>• Misrepresentation.</li> <li>• Model’s opaqueness.</li> <li>• Algorithmic oppression and exploitation.</li> </ul>	<ul style="list-style-type: none"> <li>• Values embedded in the algorithm.</li> <li>• Biased user.</li> <li>• Biased data input.</li> <li>• Biased algorithm designer.</li> <li>• Lack of regulations.</li> <li>• Over-trusting of data.</li> </ul>	<ul style="list-style-type: none"> <li>• Power inequalities.</li> <li>• Perpetuation of status quo.</li> </ul>

Table 02

The same model will work differently in one location or another; trends from a specific culture create dissonance when replicated globally and used as strategic insight in a different one. At the same time, many trend research platforms leverage a privileged position based in developed countries (Powers, 2019). Nations that have been Westernised import these models modifying the ways their society consumes and behaves according to standards that do not belong to their context, history, or reality.<sup>5</sup> This is exacerbated when using AI, where “the tendency of people to overtrust automated tools” (Gebru, 2020, p. 265) comes into play.

Mohamed et al. (2020) categorise as algorithmic oppression the subordination of one group under another, typical in predictive algorithms<sup>6</sup> that result biased. Similarly, algorithmic exploitation is how these algorithmic tools exploit marginalised actors for their benefit. <sup>7</sup>“[T]hese inequities are historically contextualised in global systems of racial capitalism, class inequality and heteronormative patriarchy, rooted in colonial history” (Mohamed et al., 2020, p. 667).

### **Applying Value Ethics to Technology**

The debate on the ethical implications of technology has been boarded by numerous scholars finding a base in the ethics of technology; Jonas (1979) emphasises the urgency of bringing ethical considerations into technology since humanity’s survival is being jeopardised by it. Differing from one context to another, AI is used to “recognise, sort, and predict outcomes from analysis of existing data sets” (Joyce et al., 2021, p. 2), lacking one same standard or protocol used world-wide (Webb & Euchner, 2020) to regulate its use. An understanding of ethics must consider the parameters we use to study it (Luján Escalante et al., 2021). Scattered efforts have been made to

codify ethical protocols and principles regarding AI (Asilomar, UNESCO, Belmont), resulting too specific or too general. The considerable evidence on the implications of AI in diverse disciplines is enough to call attention to how to “expand the scope of AI’s benefits and harms and reveal the relations of power that underlie their deployment” (Mohamed et al., 2020).

Shannon Vallor (2016) crafts the concept of technomoral virtues based on moral philosophy and the application of ethics to the use and development of technology, where the context in which we find ourselves is described as being shaped by technology, evidencing the need to create a different set of virtues that are related to these new social abilities enabled by it. This is aligned with Jonas’ (1979) statement: technology modifies human desires, even those about the technology itself. Vallor’s (2016) proposal bases its philosophical foundations on virtue ethics, facilitating a framework common to the diverse narratives of the world’s plurality, ensuring a collective action. This allows the framing of “broader normative implications of emerging technologies”, motivating the improvement of the “techno-social systems and human participation in them” (Vallor, 2016, p. 33). Having yet unknown implications; it demands flexibility in terms of how we might adapt in their encounter. The malleable framework enabled by virtue ethics is crucial since a moral discussion on technology sheds light on the effects a given technology might have on humans and the environment in the future, a context of constant development where “new technologies may suggest, create, even impose new ends.” (Jonas, 1979, p. 2). The moral choices of today have a world-wide effect on non-humans and generations to come (Vallor, 2016).

### **Possible Guidelines**

The following section is dedicated to a first set of guidelines as intermediate results of the ongoing research. The guidelines are meant to steer the way in the discussion of the implementation of AI; these could also be perceived as transversal practices that go across disciplines and applicative sectors, not only regarding trend research or the fashion industry. Not only does it search to promote a critical discussion on this issue, but it is also essential to highlight the actionable points and into what direction we might prefer going towards.

<sup>5</sup> For example, the One Laptop Per Child campaign, ruled out of India and China since it overlooked local education policies and methods (Nussbaum, 2010).

<sup>6</sup> Some examples on how bias affects in healthcare access, facial recognition, or job recruitment can be found on O’Neill, 2016 and Buolamwini & Geb

<sup>7</sup> Evidenced by “ghost workers” that label data for it to be useful, working under detrimental conditions (Gray & Suri, 2019), and the non-ethical beta-testing of algorithmic systems in places with no regulations around data use.

1. **Employing pluriversality:** The recurrent concept of plurality, whether discussing the decolonial concept of the pluriverse or how Vallor's (2016) techno-moral virtues construct from the multiplicity of conceptions, could also be understood as a common denominator that allows us to imagine that any possible solution should be based on the cooperativeness and collaboration of humans. In this case, framing fashion as a design discipline it enjoys the assorted skills and tools that come from the design practice. These resources already enable critical assessment and active interventions that may take us towards desirable futures that mirror pluriversal values, embracing ontological and epistemological difference.
2. **Embracing difference:** Although the emerging ethical practice proposed by Vallor (2016) sets to achieve a diverse enumeration of goods, "global community, intercultural understanding, global justice, human security, and collective human wisdom" (Vallor, 2016:51), these are not universal concepts shared by the cultures that populate the world. Nevertheless, all these actors agree in having diverse interpretations of these goods and wanting to live well amongst each other (Vallor, 2016).
3. **Involving actors:** Defining who designs algorithmic models and who sets their goals and values is crucial, "[i]f we are to work on technology that is beneficial to all of society, it has to start from the involvement of people from many walks of life and geographic locations. The future of whom technology benefits will depend on who builds it and who utilises it." (Gebru, 2020:267). The inspiration and empowerment of multiple perspectives, views from the borders, and historically marginalised voices contribute to constructing a responsible practice that may lead us into these preferable and plural futures.
4. **Developing critically:** Trying to avoid and solve the problems inflicted by AI needs to be carried out during its development (Webb & Euchner, 2020). Researchers working in this field should learn and question how AI is being used, only possible by collaborating with different disciplines and experts that bring valuable insights into the forging of ethics into the practice (Gebru, 2020).
5. **Reviewing values:** Decolonial theory intersects the values and the power embedded in AI and provides tactics that remain critical and empower marginalised communities. It allows

the analysis of its risks and opportunities by analysing algorithmic oppression in a broader socio-political and cultural context. Promoting co-designing systems that are context-aware and driven by the values of these communities allows them to include concepts like fairness, equity, and diversity through accountability and responsibility (Mohamed et al., 2020). Bringing decolonial principles into practices as trend research and fashion design carries new values, resulting in a complex layering of topics we need to evidence and problematise.

## Conclusions

Although fashion is tied to trend research's genesis, it goes well beyond that. As one of the initial research methodologies used when outlining a design project's conceptual bases and values (Celi & Rudkin, 2016), the fashion designer entails the power and responsibility of shaping future behaviours. A critical understanding and ethical debate of the overlapping of AI, trend research, futures, and fashion through design must be prioritised by centring a pluriversal perspective. This calls not only to combat the colonial tendency that presumes that one framework is valid for all the others (Tuin and Nocek, 2019) but also to question the discipline, discussing how these methodologies and tools are used to carry out the practices responsibly. Regardless of the colonising legacies that define design, it still contains the agency to describe the future responsibly by questioning and reviewing how its skills and tools enable embracing multiple ontological and epistemological values. It is essential to devise how AI systems contribute to creating inequalities in society (Joyce et al., 2021); designers are called to not only design the functions of a system but the protocols of knowledge creation where culture is expressed (Luján Escalante et al., 2021). Prioritising voices from marginalised positions to prevent further marginalisation may positively affect the outcomes of AI across many other disciplines besides fashion or design. The proposed guidelines search to ignite the conversation and deploy the complexity of the issue, evidencing that a deeper understanding of how to apply a pluriversal perspective to data sources and analysis of trends is needed. Focussing on the emerging topic of AI is relevant in our present context, AI use in trend research needs to prioritise these perspectives, where it could serve as starting point for future applications across diverse sectors.



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## Figure Captions

- Fig. 01: Trends, design, and futures. Source: Summary by the authors, based on Voros’ Futures cone (Voros, 2015)
- Fig. 02: Sources and uses of AI-powered trend research platforms
- Fig 03: Area of incidence of AI in the trend research process
- Table 01: Upsides and challenges of using trends. Source: Summary created by the authors.
- Table 02: Problem, causes, and effects of AI models. Source: Summary created by the authors.

# **A NEW MANUFACTURING FASHION SYSTEM 4.0 COMPETENCE AND ROLES IN ITALIAN CLOTHING DESIGN AND PRODUCTION**

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## Abstract

Fourth Industrial Revolution and digital technologies are driving profound transformations within the classical industrial system. Nevertheless, design and production models in Italian fashion system are not much into these type of changes. On the one hand, because of the cultural reasons related to the concept of Made in Italy – which quality is perceived as inextricably linked to the classic way of production. On the other hand, fashion products are difficult to patent, so companies face a lot of knots on legal protection of innovations.

This contribution wants to frame the current relationship between Industry 4.0 and Italian fashion system, presenting the state of innovations and limitations. The analysis of this picture will serve to illustrate how design can interact with other disciplines to manage the practices, the approaches and the tools, able to build a new useful design and productive models.

**Keywords:** Fourth Industrial Revolution, Digital Technologies, Italian Fashion System, 4.0 Competences, Soft Skills

## Industry 4.0 in Italian Fashion Manufacturing

### Economic and Social Scenario

Over the past decade, the internationalization of markets has changed economic, social and cultural conditions within fashion industry, revealing a system with limitation but opportunities to be caught. Italian fashion system has well handled the strong international competition, as evidenced by the increase in exports. According to Il Sole24ore analysis, referring to the year 2022, fashion system in Italy revenues hit 96.6 billion, the highest value in 20 years, a 16 percent more compared to 2021 (Casadei, 2022). These results were possible thanks to the flexibility of small businesses that were able to produce a recognizable product, being also able to cope with market changes.

In fact, the recognizability of the Made in Italy product has always been influenced by the particular conformation of these enterprises, whose production is concentrated in territorial areas with specialized manufacturing, the so-called Distretti industriali (Industrial Districts). This geographical concentration encourages collaboration among “neighboring” enterprises, leading to a contamination of knowledge that is reflected in the product.

The small size of these enterprises has been crucial in reacting with flexibility to the changes that internationalization has injected into the market; which has demanded for increasingly shorter delivery times. It is worth pointing out that 99 percent of businesses in Italy are micro, small and medium-sized enterprises, whose small size has proved advantageous in dealing with market demands (Rinolfi, 2017). Indeed, they have been able to quickly readjust their production and respond to market demands more promptly. Large companies, lacking structural flexibility, on the other hand, have adapted their production processes by introducing new Industry 4.0 systems. In most cases, these systems have served to reduce the prototyping, production and delivery time of their products and, at the same time, to involve the customer more closely in the various stages of designing the required good. (Rinolfi, 2017). In fact, customization is a response to the extensive conformism that globalization and internationalization have brought. Indeed, brands are demanding greater adherence to their production requirements so they can better meet the demands of an increasingly exigent clientele. According to Silvia Venturini Fendi, clients are

experiencing a new desire for unique products that reflects the necessity of individuality (Venturini Fendi, 2011). As highlighted by Salvatore Testa, professor of Strategy and Fashion & Luxury Management at Bocconi University, the advent of ready-to-wear has democratized fashion products, but it has downsized the personalization practices. The trend is reversing nowadays, since it is showing how clients are requiring more exclusive products. The satisfaction of this desire can be reached by technologies, that are also able to turn down costs and to faster the customization process (Pambianconews, 2019).

The application of advanced technologies is the almost exclusive prerogative of larger companies, as they have the economic resources to provide for their introduction. Such application has been crucial for them in compensating the lack of flexibility which belong to micro, small and medium-sized enterprises. The latter, therefore, have not been able to access technological renewal due to their limited liquidity, a fact that has limited their ability to compete with large companies (Ezio Tarantelli Foundation, 2017).

Thus, an ambivalent picture emerges within the Italian production: on the one hand, smaller

companies have a flexible production model, capable of meeting customization needs, but they are excluded from the introduction of new digital tools; on the other hand, larger enterprises are able to take advantage of such innovations, but they are not yet able to manage them virtuously, given that they have an inflexible production model [fig. 01]. In both cases, the question is how Italian fashion design and production can better exploit these resources in favor of contemporary market needs. In this sense, designers may be able to build an equitable system that can offer appropriate approaches to design and production, as well as to note which digital technologies are suitable for these purposes.

#### The Impact of Industry 4.0

The framed scenario highlighted the need for Industry 4.0 to realize those production paradigms and design approaches useful to meet market requests. In fact, these approaches need to face the new social needs related to the desire of customized products, through a judicious application of digital instrumentations.

Thus, enabling technologies cannot be applied solely as a technical tool to address and solve problems in

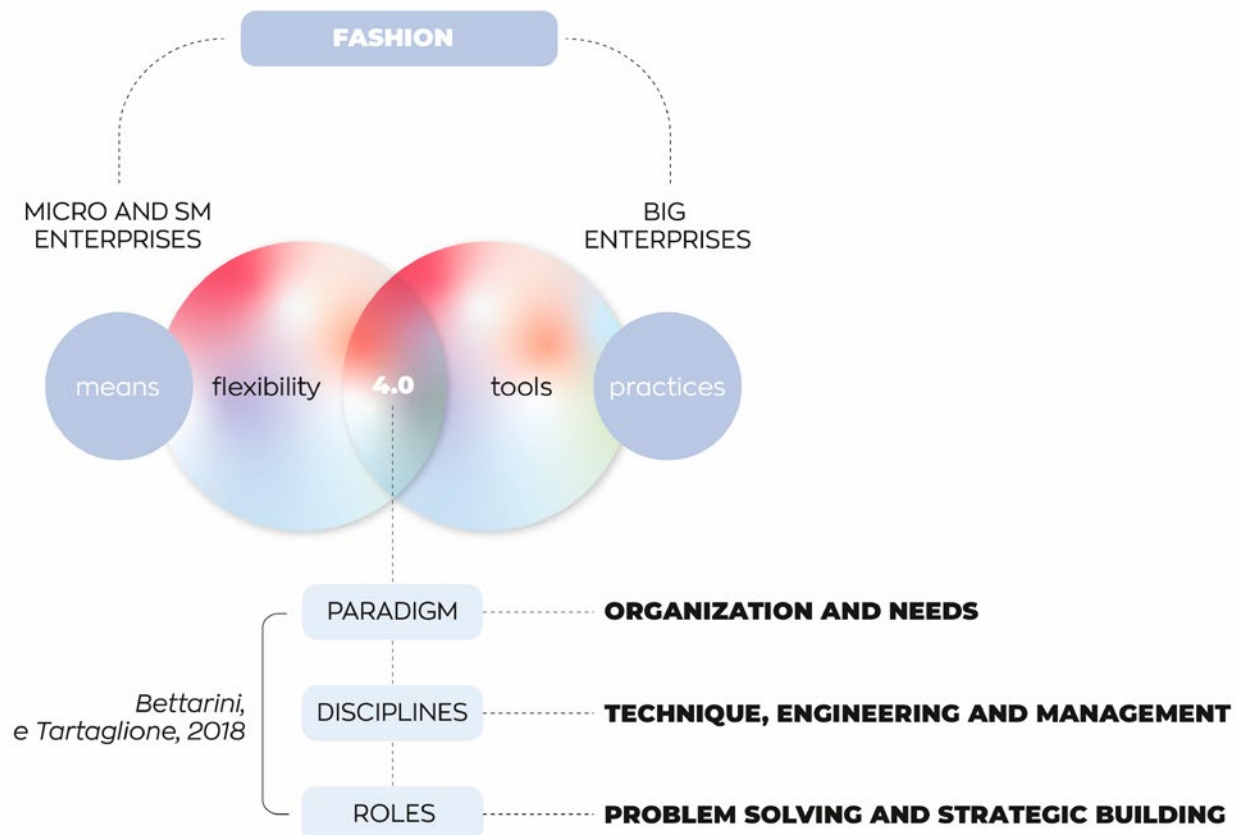


Fig. 01

faster time. These technologies have been recently conquered, and their possibilities beyond a technical-functional value are not yet duly tested. The challenge is precisely to envision useful applications for the establishment of a manufacturing 4.0 fashion system.

By framing this re-construction project, the application of new technologies, in order to be properly managed, subtend a process of job enrichment that – as argued by Gianpaolo Vitali from CNR – could put at the center human knowledge and its ability to interpret complex production phenomena; furthermore, the identification of solutions will be based on experience, so to characterize a context where products, processes and technologies will evolve similarly to these articulated dynamics (Filtem Lombardia, 2017). Human resources will have to be flexible to quickly acquire useful knowledge in handling these tools and to develop an adequate “digital thinking”. The necessity to handle technologies, at specific stages of the process, is a fundamental condition to realize this change, but it needs to be supported by transversal skills. The actors involved in the design and productive processes need to understand changes, so to satisfy these requests through the tools available to them. Therefore, it is necessary to acquiring a renewed problem solving approach and to develop management skills. This set of skills represents a system of capacities that can allow a horizontal communication among all the involved actors (Scheer, 2019). In contrast to the current approach – which tends to frame the work of operators as the execution of simple repetitive tasks coming from above – the digital operator will have to be multi-skilled, cooperative, and communicative: a more educated, digitized worker who communicates across the department, working in synch with team leaders, engineers, technologists, logisticians, and maintenance workers (Magone & Mazali, 2016).

All this will affect the industrial paradigm and the structure of the enterprise – no longer described as a place of mechanical application but as a dynamic entity that dialogues with the operators. It will be a matter of developing flexible environments, knowledge and skills that presuppose constant experimentation with new operational technologies.

The impact of Industry 4.0 in the specific clothing sector will thus be found on three different levels, which Bettarini and Tartaglione (2018) summarize as follows:

- definition of the paradigm shift – influenced by the impact of digital technologies on the production system, work organization and skills – that is flexible enough to promptly respond to changes;

- development of new knowledge, skills and competencies that can deal with emerging dynamics and that are able to describe and elaborate, with more immediacy and at a higher level of synthesis, the main transformations that will characterize the professions of fashion system;

- building a network of horizontal relationships, involving the main professionals, whose specific skills will be useful in addressing the changes identified as necessary to be satisfied.

## **The Evolution of Skills, Disciplines and Roles**

### **Paradigm Shifts**

The following section will highlight the changes at the paradigm level, related to the production system, the work organization and the skills. Within the Italian fashion system, digital tools are addressed to digitization processes on different levels, that have affected both the production system and the skills of workers, who have had to learn how to use new machinery and to manage it (Tartaglione, 2008). A part from this, the consistent change appears to be related to the demographic structure of the world population: there is a steady growth of the middle classes in newly industrialized countries (Tartaglione, 2008). This leads to an increase demand of diversification for fashion goods in these markets. The increased purchase capacity is forcing brands and manufacturing companies to think of new strategies to relocate and diversify their activities (Ferrucci & Picciotti, 2016). In addition, the liberalization of international markets has influenced the economic level, suffering from the confrontation between Made in Italy and a larger market that is not capable of recognize the characteristics of Italian products. In order to face this confrontation, Italy must necessarily leverage the qualitative increase of its productions, focusing on the intangible elements (Rullani, 2004), such as the skills linked with the territory. This will be possible through intensive research and development activities directed at continuous product innovations. Instead of marketing, it is therefore necessary to focus on strengthening the

research-development dimension, increasing control over the entire production chain and innovating those services related to traditional manufacturing activities (Assolombarda, 2020).

Innovations will therefore be focused on those process steps that can generate added value, and that will target well-defined product niches (Raele, 2019). This will ensure to faster reach the social changes related to demand and consumption. And thus, low-value manufacturing will instead be increasingly expedited in favor of more artisanal production.

Yet, the possibility of access to international markets is one of the causes that has generated the shift toward an artisanal manufacturing. Indeed, increasing consumer knowledge about environmental, social and economic sustainability issues has intervened to increase this shift (AA. VV., 2020). As highlighted by Simonte, the success of businesses operating in Italian fashion production have to start from the attention to detail and customization services offered by companies (Simonte, 2018).

Therefore, change must begin from the construction of more flexible processes, that can respond to customers increasingly attentive to quality, safety, and sustainability. Customization and personalization become essential services that brands and companies must be able to offer. Indeed, by linking production directly to actual demand, the entire system will be more efficient. Inventories and losses will thus be significantly reduced, and the link with consumers will also be strengthened. In addition, the strength of customized products or services lies in delivering to habitual customers the idea that they do not have to settle for mass-produced items, which are identical to millions of others, but they can state their specific preferences to be achieved (Livesey, 2010). This new structured system will clearly imposes a change within companies at the design and production level. In markets where preferences change rapidly, companies need to understand what consumers want and how to turn these demands into reality in both production and sales. So, manufacturing process must satisfy high quality standards to remain on the market: designers need to be aware of consumer preferences and production managers have to ensure on-demand production (Bettarini, and Tartaglione, 2018).

*Disciplines and Skills: Design between Engineering, Technology and Management*

According to Bettarini, Di Giacomo and Tartaglione, professionals need to develop the ability in making (including intellectually) through digital technologies, in order to accomplish a given objective, task or activity in a specific disciplinary or professional field (Bettarini, & Di Giacomo, Tartaglione, 2016). In this sense, these competences must be acquired both to enable the full application and the management of digital technologies, but also to meet production, social and economic needs that affects the clothing sector. These needs are related to the abilities to grasp the changes in taste and consumption; to anticipate the involvement of customers to experiment with new applications within production cycles; and to test new products and thus to renew their production (Bettarini & Tartaglione, 2018).

The creation of customizable items will start from the construction of a new design and production paradigm, that can involve a continuous communication to the customer, in order to define together with designers and producers the specific characteristics of the required product. It is a matter of Co-Design processes, so companies can be entities capable of producing highly customized products but on a small scale (Anderson, 2010).

At the production level, on the other hand, the specific innovations introduced will force a change of roles involved in the process, in which operators will have to develop integrated functions by overcoming traditional specializations. In this scenario, the levels of strategic skills to be developed will be multiple.

A research conducted by TabulaeX – a spin-off company of the University of Milan Bicocca, and Crisp, the Inter-University Research Center for Utilities – sought to ascertain whether and how much companies are looking for the appropriate professional skills to accompany and implement this revolution. Through the research and analysis of more than one hundred and twenty-one thousand job ads in the manufacturing sector, taken place through the WollyBi (Italian labor market digital monitor) platform, they were able to ascertain what skills are actually in greatest demand in the market (Biscella, 2016). The results of the research highlighted that there is a great demand for skills related to 4.0 innovations in the manufacturing sector. The study was also able to state what skills are the most requested and valuable. In general, the most sought skills are those related to software analysis and design, followed by automated assembly line management

skills. At the level of specific occupations, mechanical engineers and manufacturing production technicians are the most valuable (AA.VV., 2015).

This detailed analysis makes possible to detect three basic levels of skills in the area of Manufacturing 4.0: a technical-scientific one, related to the field of engineering; a technical-professional one connected to savoir-faire activities; and a managerial one, in which management competences are related to different stages and processes.

More specifically, on the subject of engineering knowledge languages dominate those related to programming and practical software management, applied mainly in the phases with less added value, mostly to speed up the placing and cutting phases. In fact, the industrialization and cutting phases are the ones that can be easily performed by software, since they are purely “mechanical”. In this area, however, there is a deficiency in the training system, which seems to disregard the software currently in use within companies (AA.VV., 2015). This happens because companies do not use a single software: usually they are too expensive or difficult to manage without adequate training support, which is often absent in the educational system.

Professional-technical skills include the knowledge related to the use of new machinery, the communication and the team working skills. This latter will be fundamental to connect different operators and to act as an integrated system. At the same time, however, the production structure requires the worker to be flexible and to develop

autonomous work management skills. Tasks are no longer related to standard process, but they are the result of continuous experimentation and adaptation, in which the worker will have to be able to self-manage to produce results. Therefore, the system has always to be able to adapt to new transformations, in which problem solving skills of operators will be crucial to cope with the management of adaptive and flexible processes (Bettarini & Tartaglione, 2018).

These paradigmatic changes lead to the identification of specific skills in mastering multiple domains of knowledge. Indeed, changes related to demand and to strong international competition have affected production and imposed the development of market analysis, research and development, production, distribution and sales activities that must be interconnected in order to make the whole process efficient and faster (Bettarini & Tartaglione, 2017).

In sum, design, technical, engineering, and management knowledges will be accompanied by soft skills of a social, managerial, and problem-solving orientation, to build a more flexible and adaptive.

#### Conclusions: Designer Roles Evolution

In this scenario, as pointed out by Bettarini and Tartaglione in their book “The New Professions 4.0 in the Fashion System”, companies need to work at the level of job enrichment. In specific, these new professionals will be problem-solving oriented, and

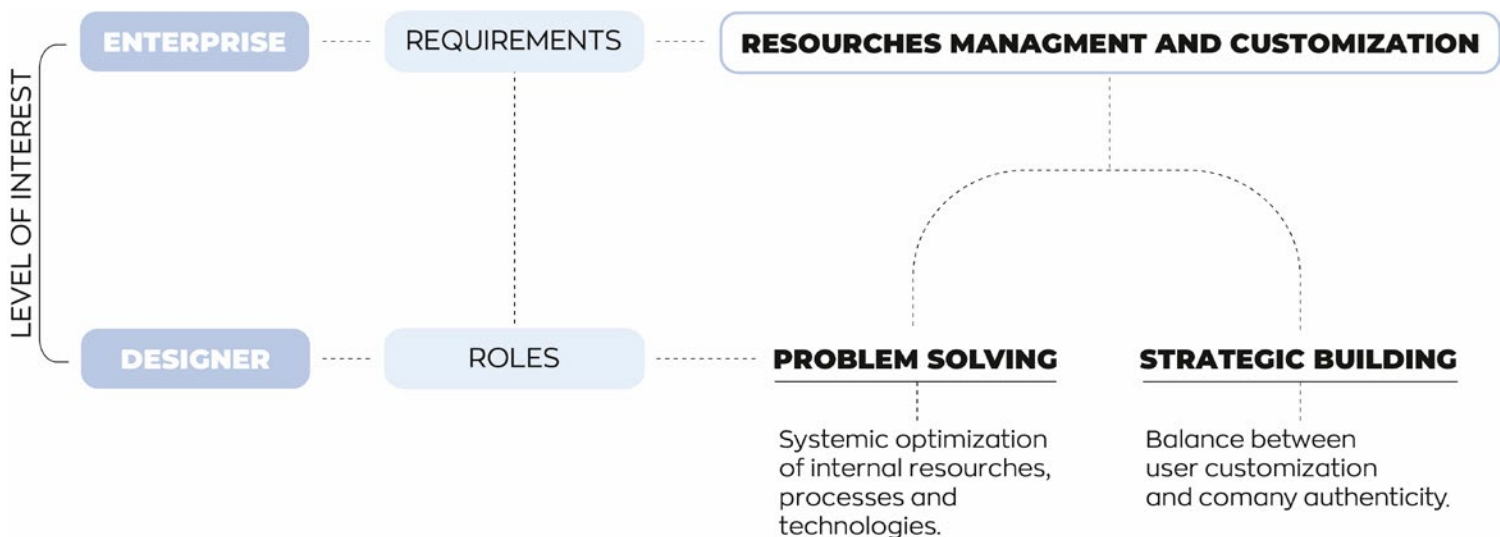


Fig. 02

they will need to develop systemic adaptability and flexibility to need the clientele requests (2018). These figures will need to share a background knowledge related to the processes and the practices of the enterprise. Indeed, this kind of management will be accompanied by the ability in mastering multiple domains and thus by the developing a multitasking approach. In order to make this process as linear as possible, the enterprise will need to be shaped a decision-making asset and operational processes in which all the involved professionals can have a straight-line communication.

Substantial change will therefore affect the profession of designer, who will act as a problem solver and strategic builder.

The designer will need to leverage design skills not only to design products, but improving design and production processes as well. In order to make processes as fast as possible and more processable throughout the chain, designers need to learn how to manage new technologies and how to combine them with more traditional practices.

As the focus of companies is more on optimizing the production process, in terms of time and cost, the designer will first need to know how to understand the issues encountered at the process level and then search for the best technological solutions. The selection of such tools will be determined by the company's economic possibilities and internal resources. In this sense, designer's work is not only aimed at the application of the most suitable technological systems, but also at the reorganization of resources at the systemic level. Thus, the optimization of the production process will come through the optimization of human and technological resources.

From a product perspective, enterprises have to meet the extremely changing and varied demands of the market. As seen, the main efforts are directed at ensuring products that can be customized.

However, the problem is to understand how a company can maintain the authenticity of its product if it can be entirely customized by the user. The designer can intervene by designing a system in which the user moves around, designing both the way in which the user provides requests and processing them in a way that is coherent to the company's cultural set-up. This initiates a strategic dialogue between enterprise, designer and user that can systematize all the options brought to bear.

Whether we are talking about optimizing the process or customizing a product, the designer must therefore understand the company's internal issues,

the market, the available technologies, and propose technologically and design-wise solutions that can bring companies closer to the 4.0 shift.

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#### Figure Captions

Fig. 01: Investigation field. The diagram summarizes the two main current problems of companies and the three levels where to intervene for their resolution. The first one, linked to micro and SMEs, is related to the impossibility of accessing the means; the second is linked to the inability of large companies to virtuously exploit new technologies. Source: Gianni Denaro

Fig. 02: Designer new roles. The following diagram illustrates what are the necessary requirements for a fashion company and what are, consequently, the roles that designer assumes to solve the illustrated problems. Sources: Gianni Denaro

# THE METAVERSE AS AN OPPORTUNITY FOR THE DEVELOPEMENT OF FASHION DESIGN

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## Abstract

This paper refers to the relationship between the fashion system and digital transformation, focusing on fashion streetwear and the Metaverse's digital worlds. The analysis goes briefly tracing the main stages of the evolution of the digital worlds in recent years, highlighting the points of contact and the contaminations with the material world, which are outlining new connections and unprecedented developments. The image and language of fashion clothing, generally material, maintain its strong communicative value even in the digital world, through the figure of the avatar.

The Metaverse is able to create new opportunities for fashion and suggesting future developments that have a strong impact on the lives of young people, increasingly blurring the boundaries between the real and virtual worlds.

**Keywords:** Metaverse, Streetwear, Fashion, Communication, Avatar

## The Metaverse and Digital Worlds

The paper aims to explain the relationship between fashion system and digital transformation. In particular, the research tries to understand the possible development of fashion streetwear inside the Metaverse.

The analysis regarded the last decade's period when society is characterized by digital applications. The digital has been mostly developing since 2019, during the lockdown, and now its diffusion widely supports people in their life routine, also representing an opportunity for economic growth. Besides, in the contemporary scenario, the continuously changing communication channels are more and more focused on virtual ones.

The relationship between Design and Digital society has been recently redefined by the blurred design (Grimaldi, 2014), a new vision of the discipline that has been changing since it was born.

This branch of the discipline, operating inside the digital field, has been modified and the bi-dimensional dimension is overlapped by a series of possibilities: multilayer data and interaction opportunities progressing and pervading every form of communication and most of the other design fields.

Today, new technologies contribute strongly to improve our life, relationships and performance.

The new digital society, based on web connections, and data sharing, is centered on new relations and immaterial spaces.

Inside this dynamic generative and changing scenario, the design practice for relations is fundamental for new forms of development. Semantic and informative products, virtual spaces, and services allow to elaborate new places of complex interactiveness.

The Collins English Dictionary defines the Metaverse: "A proposed version to the internet that incorporates three-dimensional virtual environments. A three-dimensional virtual world, especially in an online role-playing game. The universe as portrayed in a given work of fiction"

According to these definitions, the Metaverse can be described as a parallel three-dimensional virtual environment for social connections and, also for entertainment, where avatars can move and interact with each other, and more "The metaverse is the convergence of two ideas that have been around for many years: virtual reality and a digital second life". (Chen, 2022)

Currently, virtual worlds can be easily accessed

through consoles, computers, and smartphones but for a real immersive experience, it is necessary to access through Augmented (AR) and Virtual Reality (VR) technologies, representing the next frontier to live full Metaverse experiences.

Nowadays, the Metaverse is however at the beginning of its development, simply representing a concept, a new way of realizing social interaction and communication.

The idea of the virtual world is not new in the human mind and, it has been evolving for many years according to the development of technological innovations, appearing in the Eighties decade with text-based role-playing games multiuser. In literature, the post-cyberpunk current, the evolution of the Cyberpunk one of the Eighties, proposes the concept of virtual reality in the novel *Snow Crash* by Neal Stephenson for the first time in 1992, from which the name Metaverse derives (Nover, 2021). Thus, the diffusion of the idea of parallel virtual worlds, where people meet to play, to work or socialize has been spreading since the Nineties. An example of the first kind of virtual worlds was the *Worlds Chat*, an application of a three-dimensional digital space where virtual users could navigate having sound and spatial experiences, which was successfully launched in 1995. Successively, virtual worlds were proposed by multiplayer online games such as, among the most popular: *Second Life* in 2003, *Roblox* in 2004, *Minecraft* in 2009 *Fortnite* in 2011.

The diffusion of these virtual worlds goes hand in hand with the development of technology and the web. In our days the Metaverse proposes digital spaces offering alternative places to live experiences, meet people, play games, work, and do shopping using cryptocurrencies and Non-Fungible Token (NFT). Moreover, the virtual worlds give the occasion to create new business opportunities, defining new kinds of professions for the next future.

Nowadays, the success of the Metaverse is growing while in the past decade, people and technology development were not ready to understand and use it. Currently, two main factors determine the success of the Metaverse: the first is the level of popular diffusion and daily use of the web, and the second is the fact that the main users of new applications (such as social networks, Multiplayer video games...) are the digital natives, Generation Z and Alpha. For them, the use of digital technologies is part of their daily routine and of their lives. For these reasons, it is possible to say that contemporary society is ready for living experiences in the new digital spaces.

## Generation Z and Avatars

Young people of Generation Z, the first digital native generation, are socially open-minded focusing, for instance, on such as civic engagement, race equity, and environmental protection, (Combi, 2020) in accordance with the 2030 Agenda for sustainable development. They prefer to be actively involved in the field to carry out their ideas and values. Social networks and the Metaverse appear to be the more suitable channel at their disposal to be constantly connected and operative.

The Metaverse offers a lot of development perspectives by providing new virtual spaces where avatars can live new experiences, especially using Augmented (AR) and Virtual and Virtual Reality (VR) technologies. According to this way, new scenarios and open opportunities for development are created at disposal of innovative users.

Nowadays, young generations are continuously connected to the web communicating with each other through social media, like in the past young people used phone calls and SMS to communicate. As a consequence, in the actual scenario, the virtual worlds of the Metaverse can represent, especially for new generations, a natural place to communicate, and live sharing immersive experiences, also giving them opportunities for learning and for business.

As the Metaverse is a very engaging immersive special social media, the avatar, defined in the Collins English Dictionary, as... "An image that represents you on the screen in an online game or chatroom" and also "...a movable image that represents a person in a virtual reality environment or in cyberspace" is an essential part of it and the avatar's appearance is a way to present yourself to the virtual community. "The avatar becomes both an extension and a model." (Günzel, 2022), "... that is to say, the inclusion of the player's bodily representation in the virtual environment through the avatar" (Di Letizia, 2020).

In the real-world people communicate their ideas and values also through their own looks and "apparel", likewise in virtual worlds, the avatars communicate using their appearance, made of virtual skins. According to these thoughts, fashion, as a communicative expression of the body, finds new spaces of expression with new rules in the Metaverse, giving life to new application methods. Thus, the link between Metaverse and Fashion is very close. Since it is established that fashion is a privileged channel used by young people to communicate their ideas, values, thoughts,

emotions, and moods as it was for the subcultures that followed one another from the Sixties to our days, this can also be applied to the digital world. Thus, young people need to show themselves adequately even in the Metaverse, in part by imitating the real world even if absolutely with different constraints.

The analysis aims to evaluate the relation between fashion and the figure of the avatar intended as the image or the extension of the real people in the virtual space.

Streetwear represents the sector of fashion adopted by younger generations to communicate and it is differently characterized according to the scenario and the historical period of reference. In 2023 streetwear is a kind of informal style of clothing

full of social values. The contemporary asset of the streetwear system uses mainly digital applications as channels to communicate values to Generation Z. The streetwear phenomenon, appeared for the first time at the end of the Eighties in the USA and in particular in California where young people started to mix different kinds of casual and sportswear clothing taking them from basketball, skateboarding, and surfing, and at the same time, taking inspiration from social values expressed by rap and hip hop music and graffiti art movement. Before the beginning of the web, the channels to pass streetwear ideas were mostly the streets, pubs, and discos. Furthermore, music bands and movie actors influenced younger generations by representing real examples to imitate in the



Fig. 01

way they dress up and behave. In the Nineties decade Kurt Cobain of Nirvana group, is an example of this trend, representing the Grunge subculture and streetwear (Giraldi, 2020). The communication channels changed with the advent of digital innovations. Today in the digital age, young people's reference spaces, are not only the physical streets, squares, clubs, or gyms but mainly virtual ones on the web. Among the virtual places offered by the Metaverse, the videogames represent an opportunity for young people to live exciting experiences and at the same time, they are an interesting scenario for fashion. During the lockdown for Covid emergency, videogames became the favorite place to meet people, live pleasure experiences, and socialize from home. The diffusion of the use of video games has facilitated the creation of a connection between video games and fashion. The collaboration between these two different sectors was born because the appearance of the characters to be more realistic needed to be like that of real people and the clothing helped this need.

An example of this trend is the collaboration of Vivienne Westwood with Final Fantasy XV, in which Lunafreya's wedding dress is a model of her couture collection Gold Label. The dress, like in the real world, adds many tailoring details, giving importance, and suggesting a particular mood in the virtual world of the game.

Alike, the avatars of the users need to personalize their look to represent themselves in a realistic way but the basic customization offered by the game is often not enough. For this reason, video games offer a shop where gamers can buy different skins. Nowadays these skins are more and more designed by fashion designers or they reproduce real fashion streetwear collections. In this regard, Mark Zuckerberg underlined the importance of the image of the avatar, especially for young generation, "...Avatars will be as common as profile pictures today, but instead of a static image, they're going to be living 3D representations of you, your expressions, your gestures that are going to make interactions much richer than anything that's possible online today. You'll probably have a photo-realistic avatar for work, a stylized one for hanging out, and maybe even a fantasy one for gaming. You're going to have a wardrobe of virtual clothes for different occasions designed by different creators and from different apps and experiences". This vision has been progressing, offering new opportunities for the development of the fashion system (Adegeest, 2022)

## **Fashion Communication**

Among the others, social networks represent some of the most popular virtual spaces where people meet other people, and share experiences, ideas, pictures, videos, and thoughts. These spaces are easier to reach from everywhere and at every time than real ones because, it is not necessary to physically go to a place to meet other people, but is enough to have only a smartphone.

Until the 2000s young people used to prepare themselves to meet others, choosing their outfits carefully in relation to the place and the occasion of the experience to live.

In virtual spaces, young people still take care of their images using digital tools. For example, there is a large diffusion of photo editing and retouching applications that offer a wide number of filters easy to use even by a nonprofessional public.

Everyone is able to transform images and videos to appear at their "best" on any occasion, even if, fortunately, the newest Bold Glamour extreme filter of Tik Tok has been changing this trend for few months.

These digital communication channels assume great importance also for the streetwear fashion sector which, until a few years ago, considered the street as the place of origin of new behaviors and trends.

In the late Seventies, for instance, the journalist Bill Cunningham used to take shots of common people wearing original outfits while walking on the streets of New York City and Paris. Then the photos were published in the New York Times to reach the public. Thanks to spontaneous shots "from the street", common people became protagonists, showing a new way of being and generating followers. For this reason, Bill Cunningham could be considered a pioneer of today's influencers (Giraldi, 2022). Moreover, in 2005, the web became another new communication channel for the diffusion of streetwear directly from the street thanks to the success of the Sartorialist blog. The blog published common people like fashion models and as a consequence, these people have become real influencers.

This blog is also responsible for a change in fashion communication and in fashion photography that no longer limited to being the image of reality. If at the beginning the picture of common people were spontaneous they soon began to be studied and retouched.

Thanks to the introduction of the possibilities



Fig. 02

offered by digital photo retouching techniques many fashion companies started to use extremely refined shots to communicate their brand values to their public.

Today streetwear, as a fashion sector born by the younger generation, finds its favorite channel of communication in social networks such as Instagram, Tik Tok, and YouTube, which are also used for shopping. Through social media, the fashion streetwear passed from being for only a small group of young people to a wide public of reference.

As a matter of fact, social networks have radically changed habits and consumption, offering a variety of options for the realization of ideas and content, promptly exploited by the market, in the continuous search for new advertising and communication channels (Hancock, 2021). In particular streetwear fashion brands such as, among others, Stussy, Off White, or Supreme (Fabbri, 2022) choose social media and virtual places as main channels to communicate to Generation Alpha and Z.

A few years ago Generation Z redefined the today aesthetic of streetwear according to new values mainly connected to the idea of sustainability, giving new meaning to the concept of beauty, searching for authenticity, against the idea of fake esthetics, following the movement of #body positivity, promoted by young African American women in the USA in about 2010.

From one side social media are used by fashion streetwear companies to communicate with the younger generation and on the other side the younger generation use social media to communicate their ideas generating a circular movement of mutual influence

Furthermore, regarding the idea of planet protection and sustainability, in digital scenarios the use of social media represents many advantages as digital fashion by saving on real products and avoiding the production of waste.

For several years now, virtual avatars, electronic images created to represent people on video games,

social networks, and in general on digital spaces have become very popular and everyone who uses social spaces has one or more of them.

The avatar is not only a virtual person, it is the sign of a person, it stands for a person.

From this perspective, the avatar has been assuming a real strategic role in the fashion industry for a few years. The users of digital spaces create their own avatar and customize the image by buying digital clothes and accessories.

Fashion is a research discipline and an applicative field very suitable to experimentation and innovation, particularly referring to those offered by digital technologies.

On one hand, digital fashion is to be considered a natural extension of the real one, made possible with the application of filters and retouching on pictures and sharing on social media. On the other hand, regarding the digital spaces in the Metaverse, Artificial Intelligence (AI) Virtual Reality (VR), and augmented reality (AR) are offering new

experiences to the public.

Some actual examples of these applications are the virtual visits to showrooms and the participation in fashion shows with or without VR glasses.

### **Digital Fashion Shows and Digital Influencers**

Nowadays, through the new technologies, many fashion shows are designed and realized in a virtual way as fashion models. They are avatars able to move and to interact autonomously with other avatars thanks to Artificial Intelligence.

In the Metaverse, the worlds are virtual as their inhabitants, in the form of avatars, who lives parallel lives in the real world.

Even if in the virtual world there are fewer constraints and therefore more opportunities to detach from real-world habits, there are still many similar figures between the two worlds. One of these is the influencer, who is the key point of fashion communication.



Fig. 03



Inside the new immaterial world, the influencer has become virtual one. A very popular example is Miquela Sousa, also known as Lil Miquela, a fictional character generated by Computer-Generated Imagery (CGI). She has been an account on Instagram since 2016 and now she has more than three million followers.

Lil Miquela is also a fashion model collaborating with famous brands such as Supreme, Prada, Chanel and Calvin Klein. She is virtual but appears in photos with real VIPs like the famous model Bella Hadid. Miquela is also a singer of very successful singles with millions of plays on Spotify. She took part in the Milano Fashion Week in July 2020 a totally digital edition, caused by Covid 19 restrictions. Miquela, Noonouri, Daisy, Imma, Shudu are some of the virtual influencers with millions of followers on Instagram, who have been collaborating with the most important fashion houses for a few years. All of them are fashion avatars who were created specifically to convey advertising messages in digital worlds.

After the first digital edition of the Milano Fashion Week in emergency, other phygital edition followed as other events such as that of Christian Louboutin which used the digital channel to present the collection Spring Summer 2021 during the Paris Fashion Week, by staging Loubi World, and collaborating with the Zapeto app, combining virtual reality and gaming. In Loubi World, the user can create an avatar version of himself/herself experiencing exclusive parties. Moreover, the user can earn coins for shopping of virtual products. In 2018 Alessandro Michele foresaw the importance of digital fashion realizing a fashion show for Gucci inspired by the cyberpunk literature of the Eighties and pointing out the human fear about the cyborg and the concept of hybridization.

Furthermore, a golden virtual dress designed by Dolce & Gabbana sold at auction for more than one million dollars in 2021 to confirm this trend.

Today the digital is not only an alternative channel of fashion communication but it also represents a new way of realizing fashion. The avatars are used like models and influencers but, at the same time, the avatar-users, living experiences in the virtual spaces, are the customers of virtual apparel, especially in the Metaverse whose users are the youngest people of Generation Z

The fashion companies are trying to establish themselves in the digital world: in 2021 Nike opened Nikeland on Roblox, in the same year Ralph Lauren launched the Winter Escape on

Roblox, Balenciaga started an in-game clothing collaboration with Fortnite where the players could buy clothes of his collection both for the in-game characters and to wear in the real world and, Moncler proposed the collection of digital reactive clothes, in collaboration with Fortnite, inspired by the collection 6 Moncler 1017 Alyx 9SM designed by Matthew Williams.

Moreover in 2022 Tommy Hilfiger streamed the New York Fashion Week show on Roblox, launching the collection Disco Drip on Open Sea on Web3, a new collection of NFT Non-Fungible Tokens to underline the link between fashion and cryptocurrencies.

Finally, always in 2022 the collaboration between Nike and RTFKT produced the AR Genesis Hoodie, a new kind of garment with innovative functions. It is produced in both material and digital versions for avatars. An NFC chip and a QR code embedded in the hoodie are able to interact with the AR creating new visual experiences

This product represents a new typology of clothing able to create unexpected connections between different worlds.

What the above described really happened and new development are in progress. Virtual and real spaces have many points in common, material and digital worlds mix themselves and their lines appear more and more blurred.

## Conclusion

Nowadays the boundaries between the real and virtual worlds are blurring more and more and, especially the younger generations live astride parallel worlds. For them sometimes it is difficult to understand the line between the material and intangible world.

From the new possibilities offered by the fewer constraints of the digital world, new opportunities, ideas, products, and applications arise and consequently also new professions emerge.

The 5G fast communication technology, the further developments of AI, the GPT chat, and the other continuous applications of the technological innovations of the digital world continuously open up new, even unexpected, development prospects. Generation Z and Alpha are called to make their contribution both as recipients of new applications and of immaterial fashion and also as new designers. Therefore, it is predictable that in next future we will see further developments in

digital fashion and streetwear as a communication channel for the new values of young people will also establish itself in the Metaverse generating new forms of communication clothes and accessories.

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## Figure Captions:

- Fig.01: Lightning, the heroin of Final Fantasy XIII, testimonial for Louis Vuitton in Spring Summer Collection 2016.
- Fig. 02: The virtual influencer Lil Miquela with Bella Hadid for Calvin Klein campaign July 2019 on lilmiquela Instagram account.
- Fig. 03: The collection of digital reactive skin Moncler for Fornite, November 2021.



# KNITTING OUT THE TOUGH HUNGER

**A RESEARCH PROJECT TO DESIGN THE OVERCOMING  
OF POST-PANDEMIC EMOTIONAL FEAR OF TOUCHING**

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## Abstract

The pandemic has altered human attitudes affecting common gestures: hugs, kisses, hands shaking, all the human behaviors related to touching have become dangerous, generating what scientists called “touch hunger”. If with touch we define ourselves as our form of being in the world we are in front of complex touch-related costs that make people today feel lost and distant.

Starting from this premise, the research team in the knit design of \*\*\*affiliation\*\*\* has been working to relate scientific data and innovative design languages to help people in redefining and rediscover the human attitudes that connect us with others.

Exploiting digital technologies, innovative materials, and tactile surfaces belonging to the world of knitwear and textiles, researchers designed an emotional and sensorial journey to guide participants in overcoming the fear of touching, finding new possible ways of being together.

**Keywords:** Textile Design, Knit Design, Touch, Human Feelings, Post-Pandemic Behaviors

## Introduction

Covid-19 pandemic brought heavy changes for multiple aspects of human life, going far beyond the immediate impacts on physical health. All the collateral circumstances impacted on our daily life, habits, the spaces we live in, our sense of freedom, the way we relate with others. Indeed, the isolation, the restrictions and the fear of contagion with which we became familiar altered so much the human attitudes that they end up in affecting common gestures. Hugs, kisses, hands shaking, all the human behaviors related to touching have been progressively abandoned, generating what scientists called “touch hunger” (Banerjee et al., 2021). To Ghilardi (2016) with touch we define ourselves as our form of being in the world: this highlights the pervasive importance of touching and the burden of touch deprivation on our daily-life as well as on our mental health. To Green and Moran (2020) we deal with complex “touch-related human and emotional costs” that make people today feel lost and distant, no longer able to resort to those ancestral gestures with which they used to know and recognize others at a primordial level.

As designers, the authors of this article are particularly inclined in observing people’s behavior, the way they interact and create bonds with others, objects and places. When the changes they were they were observing was confirmed by scientists, they asked themselves how design – textile design in particular– could help people get closer and gradually abandon the fear of contact. In textile design, the haptic dimension has always been central and is today decisively reaffirming its predominant role in the discussion on the digital transformation. Among the diverse branches of design, researchers found in the intrinsic features of textile and knitted structures a possible medium to guide people in rediscovering the gestures of touching, the relationship with the object –textile– and, not least, the interaction with other human beings. The article presents a research work that started with questioning whether and how design could have a positive impact in the possible recovery from this harmful situation, and that resulted in the use of textile and knitted structures as design tools to be experienced by the public in post-pandemic times.

## Background

### The Touch Hunger

Pandemics, natural disasters, or other crisis events are known to pose a threat to mental health and affect the cognitive well-being of individuals.

Review studies concerning the Covid-19 pandemic (Perna et al., 2020; Wang et al., 2020) have found its negative impact on mental health, resulting in stress, anxiety and depression. The pandemic itself, and the consequent isolation, produced a sense of fragility and uncertainty, and brought physiological and social changes (e.g., in the sleep-wake rhythm, physical activity, nutrition, exposure to sunlight) that have a direct impact on human emotional brain and dysregulate it.

According to these studies, everyone, to a greater or lesser extent, had experienced bad sensations like insecurity, confusion, emotional isolation, fear of being marginalized and felt alone or distanced from others.

The separation and segregation we experienced gave also rise to social touch deprivation: the most common gestures through which we connect with others like hugs, kisses, hands shaking, started to be perceived as dangerous and generate fear (Green & Moran, 2021). They have been progressively abandoned and rejected, generating what scientists called “touch hunger”. In their study, Banerjee et al. (2021, p. 2) state that “humans are neurobiologically wired for touch receptivity”, and “social touch is a common and mutual way of expressing affection, care, and intimacy”. Touch is used by humans to convey reassurance, comfort, support, and empathy (Hertenstein et al., 2006), and the extreme situations reveal the importance of touch as a measure of communication: indeed, “as the physical contact and intimacy have gradually decreased and abolished in some cases, ‘touch starvation’ or ‘touch hunger’ has risen” (Banerjee et al., 2021, p. 2). The scientists start from what written by Field (2014) about touch as a form of emotional expression and as a conveyor of affection and positive feedback to the brain; going on discussing how touch deprivation “has shown to increase stress and compound trauma, disrupting psychological resilience and coping” (Banerjee et al., 2021, p. 4). Moreover, to von Mohr, Kirsch, and Fotopoulou (2021) touch deprivation is associated with higher anxiety and greater loneliness.

Despite the opportunities to connect that we have with virtual communication technologies, we see how touch still has a biopsychosocial value that

cannot be replaced by digital technologies. In this sense, the pandemic reminds the importance being physically together, of social proximity and expression through ‘touch’; it served to bring new attention and awareness to our emotional mechanisms and to the relation with others in everyday life.

From these premises, the research presented here worked to relate scientific data and innovative design languages to design and develop a participatory emotional and sensorial journey that, thanks to the combination of up-to-date technologies, innovative materials, and tactile textile surfaces could guide participants in overcoming the fear of touching and finding new possible ways of being together.

### Design, Psychology and Technology in a Mix to Arise the Senses

When Nietzsche states that “body I am in all respects, and nothing else; and soul is nothing but a word to indicate something of the body” (2005), he draws attention to the importance of the sensations that our body warns directly and practically; therefore no longer the celestial, superior and invisible body-spirit but something true, real, made of flesh.

Psychoknit is the will to create an immersive, physical and tactile design project that surrounds the visitor - with his being a physical and spiritual body - in which people could experience a sensory “rebirth” after a long time spent without being able to express their sensations due to the pandemic. The contribution of Design is fundamental.

If it is true that, as Merleau-Ponty observes, what is given is not only the thing, but the experience of the thing, a nature that transpires through a story (Vitta, 2016), then the experience of traveling a space in which different stimuli, and therefore different sensations, were encouraged by the interaction with the fabric was the center of the designers’ reflection.

Our relationship with objects is predominantly sensorial in nature (Vitta, 2016) and design, like all cultural expressions, shows that matter does not appear (Flusser, 1993) until it is given a shape, and only once in-formed, begins to appear.

Textile and knitting projects have been used in the last century to convey messages and generate reactions in the public. It is the case of knitting as craft activity, that have been often used as an activism practice to stimulate senses. With its huge visual messages, knitivism replaces the act

of screaming as a protest, by hitting viewers' eyes before their ears and by allowing a different sensory process of storytelling to emerge (Greer, 2008). Same for urban interventions with textile and knitting, that do not mean joyfully embellishing monuments with colorful wool, highlighting the greyness and sloth of institutions in front of destruction. With this action the citizens, feeling unheard by institutions, literally and metaphorically take their space in the dialogue about and this about politics of reconstruction and urban renewal (Baldini & Pietrucci, 2017). Knitted structures have been also used by artists as a mean of expression to reflect on contemporary themes. It is the case of the artist Threadstories, that creates crochet masks as visual interpretations of how we sanitize, edit, manipulate and manufacture our lives and our appearance on social media, whether intentionally or not.

Moreover, is not novel the connection between knitting and healing of body and mind: the bilateral, rhythmic, and repetitive movements involved in knitting engage brain capacity and appear to facilitate a meditative-like state, a decrease in heart rate, and slower breathing (Prigoda & McKenzie, 2007). Due to these positive effects knitting has been explored as a therapy medium for individuals suffering from a wide array of conditions ranging from depression to chronic illness, anxiety and aging.

Despite being different from a manual exercise for participants, this background served to researchers as a starting point to imagine how knitted structures could convey wider, shared messages and guide the public in rediscovering positive feelings. In the case of Psycoknit project it was essential that the textures of the different fabrics appear and reveal themselves: Unawareness, Detachment, Anxiety, Insecurity, Joy, Affection, Astonishment were the sensations to be communicated through the fabrics, so that the audience was immersed in pure psychophysical sensations. Jersey, carpeting, textured fabrics, 3D knits became the material of design which, as in any other sphere of culture, becomes the way shapes appear to become experience.

Knitwear was the most appropriate working method for constructing the sensory journey. In knitting you can use different yarns to enhance tactile sensations, and technology to enhance its characteristics.

To Merleau-Ponty (1945), perceiving means believing in a world and in this case Psycoknit, through

textile textures, invited visitors to imagine certain sensations that they had experienced when isolated. Here, imagination, as representation and self-representation, has a fundamental importance as through it human beings establish connections which become stable (Ruggeri, 2004) and give rise to thought through the bodily experience of pleasure and pain.

### Methodology

To use textiles and knits to guide people in rediscovering the human attitudes related to touch, researchers needed to relate scientific data with design languages belonging to the field of textile, and consequently to translate the relation into concrete outputs defined with yarns, stitches, volumes, color combinations.

The methodology followed 4 research stages:

1. Literature review on medical and psychology journals to identify the predominant post-pandemic human fears, behaviors and feelings.
2. Focus group composed by 3 knit designers and 3 design researchers to find the correlation of the emerged relevant post-pandemic feelings (harmful ones and need of positive ones) with textile and knitted structures, based on tactile and visual sensations aroused by certain textures, materials, and colors.
3. Design of the pilot event as a rehabilitative journey through 7 textile-knitted rooms, each one associated with a feeling, from negative to positive ones.
4. Collection of qualitative and quantitative data combined with the direct observation of participants during the pilot event, to analyze the reflections and changes in the participants' behavior and their responses during the experiential journey.

### Psycoknit

#### The Project

If it is true that, as Kant states, we know nothing other than our way of perceiving objects (Vitta, 2016), then Psycoknit, created by the research group KnitDesign del Dipartimento di Design del Politecnico di Milano e Froy, young project led by knitwear designers formerly students of the School of Design Politecnico di Milano as put together knowledge and methodologies from Design, Psychology and Technology to

build a textile-sensory experience that could arise reflections on the psychophysical changes of interpersonal relationships. Among the traditional and technological materials, textiles are presented as the ones that more than others can make a space sensory (Fiorani, 2003). Therefore, through an imaginary journey from room 1 to 7, 7 sensory experiences were proposed, from the absence of a physical and visual relationship to that of a tactile relationship, passing through an immersive interactive space that related to the visitor through the materiality of knitted fabrics. To Maggiore (2016) the living beings are embodied natures that would not exist without their body, since only through it they are linked to the materiality of the world and can recognize the world in all its manifestations. From here, Psycoknit wanted to demonstrate, by using the practices of design together with the theories of cognitive psychology and textile technologies, the close relationship of our “being body” only through the sensations we experience and perceive.

#### The Design of the Pilot Event: the Path through Psycoknit

Psychoknit event was designed as an individual and choral experience proposed during the Milan Design Week 2022, hosted at the Fabbrica del Vapore of the Municipality of Milan.

By projecting the visitor into a playful dimension, the installation aimed to raise the awareness of the public on the importance of interpersonal relationships after the Covid-19 pandemic. On the one hand, it brought mental health discomfort to the fore, highlighting the altered dynamics that the global pandemic situation has generated; on the other hand, it guided visitors in rediscover the physical dimension of the relationship with others, making them pay greater attention to listening to the other and becoming aware of one’s self, in order to be able to create a new way of being together to find each other as a community.

To narrate today’s sociological and cultural changes, the authors have chosen an ancient, material language that has its roots in the history of humans: knitting, namely the intertwining of a yarn that turns back on itself and gives life to the material. This project frees itself from the idea of fashion and textile as a product and instead starts from the roots, from the raw material, the yarn, to tell a story of emotions and let visitors discover the infinite potential of knitwear firsthand.

The different knit textures built a chromatic and



Fig. 01



sensorial journey that arise the emotions that affected everyone during the pandemic and are still experienced on a daily basis. The journey started from the most negative ones, guiding visitors in a progressive recovery where they leave bad sensations behind and prepare themselves to welcome back positive ones. The path was structured in seven rooms, dedicated to seven emotional states [Fig. 01].

**Unawareness:** The room shows the Cap\_able technology, a patent of the Design Department of the Politecnico di Milano, that has studied a opposing jacquard knit fabric which confuses facial recognition systems, protecting the biometric data of those nearby. The visitor enters the path finding himself in front of a screen that immediately identifies him with a facial recognition program. Only behind the Cap\_able knitted fabric we can protect what is most vulnerable and intimate about us, our person, identity and privacy. It is a reflection on the improper use of technology against human rights and freedom of expression.

**Detachment:** Visitors are channeled in two distinct paths and find themselves able to communicate by speaking only through knitted fabric. The fabrics prevent the eye and the hand contact in a non-linear way, leaving very small portions of empty space where people can check the presence of the other without properly seeing or touching him. It takes us back to when we were allowed

to interact only on digital platforms in a non-physical dimension and often interrupted by bad connection issues.

**Insecurity:** The two paths converge, but remain divided by a part in elastic knit. Upon entering, visitors find themselves in a literally destabilizing environment: they sink into the padded floor, lean against walls that cannot support them. The dividing wall being elastic allows visitor X and Y to touch each other, without having direct contact.

**Anxiety:** The two paths continue becoming dark, narrow, cramped. Visitors have to make their way through a knitted tunnel pressing up them.

**Joy:** The paths lead to a single common area. Visitors gather collectively in a large central room with calm and enveloping colors. The space is large and comfortable, welcoming. Visitors can stop for a few minutes and rest. Here they are pushed to interact and look for each other, to recognize the people who shared their same path and continue together [Fig. 02]

**Affection:** An environment covered in a thermo-sensitive fabric. Touching, embracing, approaching the room, the visitors transfer their warmth and can see their imprint fixed for a few seconds on the fabric [Fig. 03].

**Astonishment:** A jungle of knitted fringes to overcome with ease. The visitors emerge from the installation full of emotions, finding themselves reflecting on the feelings generated by the interaction with others and the space.



Fig. 02



Fig. 03

## Results and Discussion

The event was attended by 1200 people in 6 days. Among the 1200 people experiencing Psycoknit, researchers collected feedback from a sample of 50 people, to verify the correspondance between the physical features of the textiles and the feelings they were supposed to evoke.

All the 50 people in the sample walked through Psycoknit twice:

- 1st time they walked independently, being told they were allowed to touch everything (walls, floor, objects) and to spend all the time they need in each room.

- 2nd time they walked with a mentor that encouraged them to interact with the installation and guided them in a reflection on the feelings they were experiencing. During the path, the mentor observed visitors' behavior. At the end of the path, the mentor collected explicit feedbacks.

The diagram below [Fig. 04] shows the results of the evidences collected combining explicit feedbacks with direct observation.

The results confirmed the ability of materials and textures to arise feelings, and the important role of touching as a means of emotional expression and a conveyor of affection and connection with others. The fact that a large number of people in the

sample recognized their feelings in every room, confirmed not just how materials, textures, and colors can arise feelings, but also to what extent those feeling and common and shared. This commonality made evident to the participants how the bad sensations are not an exclusive of the individual but they unite us all as human beings. From the standpoint of design researchers in the field of textile-knitwear, the evidences demonstrated how and to what extent these specific areas of design can relate to more scientific aspects of mental and body health, and which levers designers can use to address the contemporary distress of the human body and mind. Textile design can make a considerable contribution certainly not in substituting medical

treatments, but in helping people taking care of their emotional well-being and in offering opportunities to relate and connect with others.

### Conclusions and Future Perspectives

“Could fashion objects become agents for positive change, to reweave the web of life which, in recent years, we have so recklessly torn apart?” (Manzini, 2022, p.2). Today this question is being answered by two different approaches, apparently in contrast but profoundly interconnected, of 21st century fashion design: on the one hand, repositioning man at the center of design, rediscovering the value of the human in its links with the technological



Fig. 04

dimension; on the other, the body in search of new forms of collaboration with the non-human, including nature. In this return to nature and to the matter (Fiorani, 2021), there is also the recovery of manual activity and the intelligence of the hand, essential not only in artistic work but also in the most sophisticated technologies and above all to the sense of ourselves and of our doing.

The other question that arises in the contemporary debate on fashion is what fashion is or what fashion represents or, again, which object - if there is an object - we can define as a fashion product. Fashion (Fiorani, 2003) is not just change, trend, spirit of the times, a succession of styles but the evolution of a historical, social, economic phenomenon, of a postmodern industrial culture: which implies examining the various social spheres which it invests and modifies. The dress has always been the protagonist of this speech; and the body-dress, the habitus in Bourdieu, has always been the object of fashion par excellence. In reality today the boundaries are blurred and placing man at the center again leads us to rediscover important relationships. One of these is that of the body immersed in a space, an operation that always fascinated artists and designers; since Oskar Schlemmer's first studies for the Bauhaus in which the moving body determined the relationship with space and vice versa. Ruth Richards (2007) argues that creativity can improve physical and mental health, and develop healthy, "evolving" societies and cultures.

Psycoknit made visitors immerse themselves in textile tactile spaces where the goal was to reflect on the relationship with others and, even more, with themselves towards others; those "sensuologies" that Eleonora Fiorani defines as those social formations (2003, p. 148), a new fragile and ephemeral planetary bond, in which the emotional, cultural and symbolic aspect is essential. Therefore we return to the emotions, to both positive and negative sensations, felt during the absence of bodies, or body-to-body. "Emotions modify the way in which human mind solves problems", claims Donald A. Norman (2004) in his book *Emotional Design*. "The emotional system modifies the operative modes of the cognitive system" (ibid., p. 71). Emotions are defined as vibrations that slip into the body and provoke curiosity, which, in turn, facilitates learning.

The body, the dress and the space therefore return to being the protagonists of an interconnected design discourse whose emotions become design

elements; fashion as we have known it today is changing its paradigm even more, and the designer, capable of reading those weak signals expressed by the community, has the task of going beyond the dress. Considering fabrics as the words of an articulated language, leaving them the role of communicating through touch, redefines the very role of the fashion designer today.

Anthropocentrism falls in the face of the awareness that every existence is the incomplete result of continuous mutations and ethics (Fiorani, 2021) becomes the way of living and existing starting from a place that shares with others and the culture it is ethical responsibility towards the community and care for the place. And space is the lived time of little stories, of moments which by successive sedimentations make concrete culture, a shared way, a carnal bond.

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#### Figure Captions

Fig. 01: Drawings representing the succession of the seven rooms: Unawareness, Detachment, Insecurity, Anxiety, Joy, Affection, Astonishment. Authorship: Froy.

Fig. 02: People spending time in the Joy room and interacting with the textile balloons. Property of the author.

Fig. 03: The body heat left traces on the textiles in the Affection room after visitors embraced the objects hanging from the ceiling. Property of the author.

Fig. 04: Graphic representation of the emerged evidences from the explicit feedbacks and direct observation during the pilot event. The colors in the diagram identify whether the arised sensations were positive, neutral, or negative. Property of the author.

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# FASHION DESIGN AND ART BETWEEN MUTUAL VORACITY AND DISCIPLINARY SELF-DETERMIBATION

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## Abstract

Observing the 20th century, it becomes clear how much the definition of fashion as an inferior reflection of art is definitively outdated, in favour of a more complex and equitable relationship of mutualistic inference that places fashion within the ranks of the arts of modernity. Fashion has always utilised art in its rhetoric and draws on an innumerable series of expressions and idioms, contending with art for the esteem and social prominence accorded to high culture. The granted and denied relationship with time appears central in the definition of similarities and differences, essential to understanding mutual inferences and distinctive qualities in today's increasingly complex and nuanced picture. While fashion constantly seeks (otherwise risking its very existence) a vector of engagement with the real experience of the public and with time ("con-tempo-raneo"), art lives on visionary paradoxes, on a higher spiritual need, translated into form.

**Keywords:** Art, Fashion, Contamination, Time, Digital

## Foreword: the Peer Relationship between Art and Fashion Design

Looking back to the 20th century, the era in which the relationship between art and fashion definitively flourished, it is clear how much the definition that sees fashion as an inferior and frivolous reflection of art can be definitively overcome, in favour of a more complex and equitable relationship of mutualistic inference that places fashion precisely within the ranks of the applied arts of modernity. This confrontation, equal and alternately rewarding on both fronts, has been nurtured over time and has contributed to defining that common texture of comparison, today made up of hybridisations and increasingly blurred boundaries. Since the beginning of the 20th century, fashion has several times acted as a multiplier of knowledge and played a central role in the popularisation of art. This transversal contribution, manifested in the course of a century of strong social, economic and cultural transformation, rather than leading to the debasement or trivialisation of art, has rather resulted in the dissemination of artistic motifs among social groups, which until then may have had little contact with the major arts. Yves Saint Laurent's Mondrian dress is an example of

this: if one should establish a precise moment by which Yves Saint Laurent's career took a decisive turn, this moment would certainly coincide with the presentation of the Fall/Winter collection of 1965. Inspired by the works of Dutch painter Piet Mondrian, the collection initiated a revolution in the aesthetic relationship between haute couture and the art world, laying the foundations of what would become an increasingly intrinsic union. The cocktail dresses, made of wool and jersey, concealed the complexity of the workmanship behind the lines of the composition. A difficult craftsmanship that denotes the French designer's ability to adapt a precise graphic style to the shape of the female body. The reference to Mondrian's typical palette and colour-blocking once again is not a trivialisation of art, but rather represents the emblem of a research that unites the Dutch artist and the French designer, sublimated in essentiality and geometry applied to aesthetics. There are numerous examples of the contaminations that have inspired the design of garments or entire collections such as these (in the case of the French designer, the collection was called the Mondrian collection despite the fact that only five garments out of eighty recalled the geometric traits of the Dutchman's pictorial synthesis) and still

history repeats itself years later, under other new, less literal forms, within a living metaphorical and cultural dialogue.

On 12 September 2010, pop star Lady Gaga is honoured at the MTV Video Music Awards for 'Video of the Year' and accepts the award wearing a meat dress<sup>1</sup>. Designed by Franc Fernandez based on a design by Nicola Formichetti, and produced by Haus Of Gaga, the dress attracted attention across the globe. It was named by Time magazine as the best fashion product of 2010 and simultaneously condemned by animal rights organisations all around the world.

A dress of flesh had already been made by the Canadian artist Jana Sterbak in 1987, but in this case, it was an artistic product, which appeared and was conveyed exclusively within the perimeter of art spaces and therefore had a local audience, both in terms of the geography of users and in terms of the meanings conveyed.

Curiously, the world press that covered the event made no mention of Sterbak. It is conceivable that the pop star arrived at this result of her own free will, and that her dress, due to the weight of the number of spectators reached by the staged provocation, obscured the artistic precedent in this case. However, the episode is interesting here because it almost definitively underlines one of the founding aspects of the premise: the definitive determination of fashion as a form of artistic production. The message hidden behind the artefact fetish worn and displayed to the public by Gaga was different from the one Sterbak had translated years earlier. As part of the American protest movement against the US armed forces's Don't Ask, Don't Tell, the pop star and her entourage lined up on stage at the event four former servicemen and women expelled from the armed forces because of their sexual orientation, to declare support and stand up for the Lgbtqia+ community. Where does the original artwork fit into all this? How legitimate are such literal linguistic appropriations? These are questions to ponder, but what is certain is that the product's fascination orientation, thanks to fashion, changes from academic to popular.

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<sup>1</sup> Karen Rosenberg of The New York Times compared the dress to a series of 1952 photographs of Francis Bacon posing with beef attached to his body, like wings.

## **Fashion Design: from Minor Propaganda Activity to Genuine Artistic Discipline**

In the 20th century, fashion became a frequent occupation for many artists who, having understood the propagandistic power inherent in clothing, which was extraordinarily effective in creating a strong and recognisable identity for the artist, began to use clothing as a global brand of an action that manifested itself beyond the limits of the canvas or the studio, to testify the more pervasive dimension of their own production and their own philosophy. For example, Theo van Doesburg, leader of the De Stijl movement, wore a black suit and white socks and tie to represent the negative of everyday clothing. The Dadaist Jean Arp created elaborate costumes as a form of oppositional dress, while Andy Warhol and Joseph Beuys ended up defining a new trend at the turn of the 1960s and 1970s: one wearing a white wig and dark glasses, the other a peach jacket and hat. Finally, "[...] the appearance was as important as the art itself". (Müller, 2000).

Sterbak herself, with her "Flesh Dress for an Albino anorexic" participates in a certain way in the production of fashion, insofar as the dress made, in an unprecedented way, is (and had to be) worn during the exhibition/performance, contrary to what was usually done, and in almost all of her previous production, with works of art and collector's fetishes. This is one example among many, because the meeting point between art and fashion is often ambiguous and elusive. Sterbak, a visual artist, used fashion and clothing as a vehicle for what she was trying to communicate about issues of the body and the feminine. Audiences and critics are confronted with conflicting definitions, asking: is clothing art or conceptual fashion? Similarly, in *Magic Shoes* (1992) by the same artist, a pair of high heels tied with chains elicits a response about women's lives and the culture of victimhood. Fashion thus begins to share a language similar to that of art, as the creation of dress and shoes exists not only within the domain of artistic production, but also within a sartorial paradigm that makes art an 'embodied' and performative practice. Fashion, writes Joanne Entwistle, "is about bodies: it is produced, promoted and worn by bodies. It is to the body that fashion speaks, and it is the body that must be dressed in almost every social encounter". (Entwistle, 2000). While Entwistle focuses on fashion, speaking about "[his] original claim that dress is a situated bodily practice that aims to



bring the totality of the dressed body into society” (Entwhistle, 2001), art in this case is “unseated” from the traditional role it occupies in high culture and begins to be permeated by new consumerist, popular, habitual, and everyday values. Like mass fashion, intimately subject to a form of iterative cyclical dependence on stylistic renewal (and unlike art, which until then had retained a condition of super-positioning indifferent to the passing of trends), Sterbak’s meat dress is perishable, subject to the organic transformations of time and with them the aesthetic obsolescence of the message<sup>2</sup>.

While being aware of the mutual prejudices that still anchor the two practices to distant territories of affiliation, the academy on the one hand and industry or consumption on the other, and of how they are seamless in the different ways they refer to class, gender and consumption, as well as the much broader notion of temporality, the examples of Gaga and Sterbak testify to a mutual rapprochement, practised through a transfer of field, in which art becomes fashion and vice-versa.

When fashion is placed in the context of the museum or art gallery, its value, as a mass commercial product, changes from a consumer commodity to an art installation. This process exhausts any commercial value attached to the product, redeveloping the commodity precisely through its adherence to a new value system: a rarefied commodity to be collected. Whether a designer dress or an installation, the boundaries between high culture and popular culture are thus gradually blurred, leading to a new, much more fluid field of disciplinary promiscuity, in which promising and stimulating *sui generis* experiments originate. In this way “fashion seeks to bind itself to the value system of art, so art seeks to remove the stigma of such associations”. (Taylor, 2005).

A partnership is created and fashion, ceasing to be the “other” to art, it gains a new typological positioning, qualified by a new status.

A strong subtext to this dynamic is the way in which fashion, as part of the modernist project, was historically constructed to be the other of art: that is, a predominantly frivolous entity, relegated to the domain of the feminine and the body, as opposed to art, which remained masculine, placed in the sphere of the mind and psyche, even sentimental.

Faced with this scene, “philosophy (particularly feminist philosophy) has challenged the modernist notion of the superiority of the mind over the body, arguing that corporality is central to the way we experience and produce knowledge in and about the world” (Geczy & Karaminas, 2011).

The production of fashion through the media highlights how fashion thrives in different cultural and communication fields. The cover of *Artforum* in February 1982 showed an Issey Miyake dress duplicating itself “as sculpture, as painting, and as aggressive, erotic spectacle” (Townsend, 2002). This transgression marked the beginning of fashion’s transition into the gallery and exhibition space, with exhibitions held in prestigious museums such as the Metropolitan Museum of Art, the Solomon R. Guggenheim Museum in New York, the Victoria and Albert Museum in London, the Louvre, and the Musée de la Mode in Paris.

Although embraced by museums as a means of attracting crowds, corporate sponsorships and cross-branding opportunities, fashion in the museum context is nevertheless at this point still considered inferior and unworthy of such a prestigious and valuable stage as the museum was then. The accessibility and commerciality of fashion thrives in the image-saturated society that characterises the postmodern condition, while art, protected by a cult status linked to the eternal and universal dimension it derives from history, is limited in its ability to transcend mainstream popular culture and thus to adapt to the changing conditions of a rapidly transforming society. The question on whether fashion is art or not leads to an argument, or a denunciation, whose weakness lies in not addressing the systems of art and fashion themselves (Geczy & Karaminas, 2011). For over a century, debates have focused on the art object and the fashion item without considering the linguistic and consensual frameworks that allow one to be art and the other to be fashion. Claiming that one is embodied and the other is not, is only half the story, and countering that art can sometimes be worn does not solve the issue. Art and fashion dwell in undeniably different systems, defining them as respective discourses: fashion and art inhabit different modes of presentation and reception, have different uses and are subject to variable responses within monetary and desiring economies.

The history of art from Marcel Duchamp onwards has taught us that art cannot exist without the elaborate protocols that record its experience as different, indeed special. The so-called Duchampian

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<sup>2</sup> Ironically, this work is now displayed in a spectral state of desiccation, poised on a headless fashion mannequin, preserving its status as art.



Fig. 01

revolution deprives the art object of an intrinsic meaning and transforms it into a cultural artefact whose status is conferred because of a delicate web of signs and agreements; hence we must even accept the relative specificity of art in relation to culture, class, and race. Without its consensus, ratification or veneration, the experience of art is diminished if not nullified. What fashion studies have taught us is that fashion is a very specific phenomenon of the West and of modernity (post-Middle Ages)<sup>3</sup>. Even when it contains notions of dress, costume and clothes, fashion is a discrete historical entity, just like the idea of art as the activity of specialised individuals or groups, producing aesthetic objects or experiences of critical difference to everyday life. Both derive from a social configuration of class, capital and communication that began in the late Middle Ages and Renaissance, a period that saw the transition from the rigid restrictions of religion and government to those of self-assertion, mobility, and

<sup>3</sup> Modernity can be read here in the Hegelian sense of an aesthetic phenomenon since the Middle Ages, when human beings began to have a stronger sense of individual consciousness and agency.

the ability to exercise change.

Like money itself, fashion and art are symbolic agents, but their degrees of transaction and dependence are different. Faced with this long-established framework, we must therefore ask: beyond the different areas of exchange and consensus in which they operate (uneven and overlapping), are fashion and art really the same thing? Does fashion really want to be art? And does art really need fashion? Fashion uses art in its rhetoric; it takes its cue from an innumerable array of expressions and idioms and contends with art for the esteem and social prominence accorded to high culture: to architecture, music, theatre, and the visual arts. But this is part of its nature and rather declares a perverse and predominantly agonistic relationship with art.

### The Tricky Relationship with Time

The contested and denied relationship with time appears to be central: while fashion constantly seeks (on pain of its very existence) a vector of engagement with the public's actual experience and with time (con-tempo-raneo), art thrives on

visionary paradoxes, on a higher spiritual need translated into form.

Quentin Bell eloquently sums up this distinction, also highlighting what Gilles Lipovetsky has called the “highly problematic institution” (Lipovetsky, 1994) of fashion design:

“And yet ‘fashion’, because it implies change and mutability, suggests something frivolous and inconsiderable. A judgment based upon fashion is felt to be less reputable than one based upon those eternal values, those enduring truths which, as we like to suppose, we can all recognise and in the light of which we can relegate fashionable opinions to their proper and inferior place. ‘It is fashionable to maintain...’ – such a beginning allows us to anticipate that the speaker will soon refer to something more permanent than fashion. A fashionable artist is certainly one who will abide our judgment. Such assumptions may be, in fact certainly are, true; nothing is so mortal as fashion, no flower carries within it more plainly the seeds of its own destruction; the only trouble is that when we seek for eternal verities against which we can measure the shortcomings of fashion they may be rather hard to find. But if in condemning fashion we imply that it is the product of a light-weight emotion and one that can easily be disregarded then we may fall into a very grave error [our emphasis]” (Bell, 1976).

The evanescence of fashion versus the durability of art is the real sticking point.

However, fashion studies originated within three different disciplines and from three privileged observatories, from which it is possible to draw synthetic notions about its very nature: anthropology, meaning ethnography and the study of dress as a marker of class, gender, and kinship; sociology, which then branched out into the rather nebulous term of cultural studies; and art history. While this circumstance certainly relativises the importance of the aesthetic in studying the relations of disciplinary mutuality, it also makes it possible to identify other areas of proximity between art and fashion, particularly in the instrumental dimension, practiced during the 20th century, in the processes of class affirmation within Western and European societies.

Couture, which began in 1850 with Charles Frederick Worth, represents a key point for discerning the link between art and fashion. It represents the “place” where clothes begin to take on the status of substantial, sculptural objects, where for the first-time human support

acts only marginally as an activator of an already programmed potential, disengaged from practical functionality. Worth’s talent and his aggressive self-promotion were instrumental in bringing fashion to the forefront of social progress and elevating the couturier to the status of an artist in his own right. This concept, already incipient in the 18th century, now becomes Veblenian insofar as fashion is transformed into a means of social promotion. Worth gave the consumer something more than mere quality, offering a unique, non-transitive value, comparable to that of a painting trapped between the texture of a canvas or sculpture, which was thus freed from the weight of the marble mass. In this sense, for the first time, the dress takes on an expressive ability equal to that of the art product and does so under the impetus of a representation finally freed from the constraints of a limiting temporal root. From this moment on, for more than a century and a half, art and haute couture



Fig. 02

will live a condition of reflected mutuality, which will see one prevailing from time to time over the other (and vice versa) in a strong relationship of mutual voracity that approaches cannibalism. In alternating phases, through shared windows of representation, they will feed off each other, to the point of leading art operators within the systems of industrial production and, at the same time, fashion brands to exert a prolific leverage towards the art system in general.

Several times Miuccia Prada and Agnes B have been involved in sponsorship and patronage of art (just think of the Fondazione Prada's continuous curatorial and exhibition programming, which for years has flanked and matched the brand's commitment to collecting) and fashion has entered museum spaces through the front door (from designer retrospectives to thematic and conceptual exhibitions).

At the same time, the artist-photographer Cindy Sherman, in her Fashion Series, portrays herself wearing clothes designed by Jean Paul Gaultier, Issey Miyake and Jean Charles de Castelbajac. The facial expressions and generally unkempt appearance fixed on the printed paper of the series suggest a "wrong", fleeting image, caught off guard by the camera. Clothing dangle loosely over the artist's body, the scene is tense, and the image is blurred, shrouded in a troubling sense of intimacy: it is the antithesis of a fashion shoot. Sherman uses fashion to explore ideas and concepts in the construction and representation of women, and does so by displaying an unprejudiced, undermining maturity, "which testifies to a paradigm shift in the relationship between art and fashion" (Kim, 1998).

### **Towards the Definitive Determination of Fashion Design**

This fusion process between art and fashion is sublimated again in the multidimensionality enabled by digital technologies. RO4DM3N & HoRS3S, a revisionist and contaminational history between the old and the new, curated by the artist Str4ngeThing, uses artificial intelligence as a tool of choice, to evoke new visions of contemporary culture, in which influences from Renaissance art and more current streetwear trends are skillfully blended. The resulting works refer to the idea of a black cultural Renaissance that mixes climate-oriented ideals with a fusion of high fashion and



Fig. 03

streetwear. The WRong ER4 main art collection is based on the popular conspiracy of the Mandela effect and how these logos (Nike, Louis Vuitton, Stone Island, etc.), clothing styles and even sometimes technological items, have always been part of culture over the centuries.

The traditional model of art - progeny, apogee, and decline - is no longer tenable because there is no longer a dominant concept of style. Beliefs and interests have never been so disparate. The "contemporary", as we know it in art, is a phenomenon of complex multiplicity. The same can be said of contemporary fashion: fashion continues to be branded with commercialism and the term "fashion", when used in art circles, still has a

strongly pejorative meaning. However, it is also true that the spread of art's dominance in the wake of globalisation has come to resemble more and more the ways in which the fashion always seeks to differentiate itself from what preceded it, while deriving some form of heritage and continuity from that. In this climate, what fashion has over and above art is what Adorno called the jargon of authenticity. In fashion, authenticity comes in the form of a credible link to its creator and the history of its own progression. In the case of art, authenticity has a greater weight, linked to a woman's and man's search for truth. This research should not be underestimated and in the absence of standard units of measurement, in the face of the legitimisation crises that have marked postmodernism, we are faced with a relativism in which the measure of quality is an unequal mix of consensus and conviction. The fashion system then is a production agency interested in culture. It is a huge and influential industry with many responsibilities, yet it is a reflection of the best, the worst and everything that society privileges and tolerates. We wonder what can be conveyed through this broadcasting powerhouse, whether it is possible to convey scenarios of inclusion, for fashion brands to be sustainable and successful, for the system to promote a positive and equitable society.

contemporary street fashion, move with horses and carriages in a sub-urban setting, while cars do not exist.

Image courtesy the artist.

Fig.02: Str4ngeThing, RO4DM3N & HoRS3S #19, 2023.

Image courtesy the artist.

Fig.03: Hussein Chayalan, Inertia, 2009 Spring/Summer Parade.

Photo by Chris Moore.

Image courtesy Hussein Chayalan.

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## Figure Captions

Fig. 01: Str4ngeThing, RO4DM3N & HoRS3S #26, 2023. The series imagines a world in which men of the street, iconoclasts of

# FASHION NOW!

## CRITICAL THINKING FOR CHANGE TOWARDS BIO-DIGITAL COUTURE

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## Abstract

Pursuing change in complex production areas requires attention and foresight that invests design research with advanced perspectives attentive to the fundamental balance between the artificial and the natural. The attitude or posture of contemporary design acting in actuality takes its cue from a strong impulse for multidisciplinary that evolves into intricate trajectories that foster the grafting of knowledge and practices. In a field like Fashion, design culture and critique of the current model result in a radical future prediction; digital technologies at the encounter with new logics of making, far from the goals of productivity, prefigure a radical reversal of the current model. The paradigm of the organic meeting the digital and the latter expressing mutualistic behavior builds a solid perspective to drive change.

**Keywords:** Critical Design, Prediction, Bio-Digital Couture, Matière Brute, Inverse Matter

## Introduction

Reflection on the current content of Fashion especially when discussing the necessary revision of the processes that shape the supply of manufactured goods that circulate globally, and from whose circuits it seems unable to escape, imposes an attitude, a posture that investigates to unhinge certain assumptions. The result is a general flattening on questions that are certainly urgent, effects of indiscriminate but not definitive doing to which answers must be given, reformulating their assumptions.

Questions about identity that unravels among so many belongings whose fluid nature is sometimes insubstantial; about individual and collective responsibility regarding the cognitive-technological surplus that is transformed into productive and consumer surplus; about the inability of autonomy from the circuits of the economy-world that neutralizes and flattens every difference and singularity; about the need to form and transfer knowledge between human and natural ecosystems. These, are some reflections arising within society and the market focused on the fashion system and its necessary change.

Questions that, in parallel, call for another look that investigates beyond the systems, formulates an out of the box of immanent causes whose effects need to be answered and remedied: where and when did the dialogue between the design and creative culture of Fashion, and the intrinsic quality required for the necessary fulfillment of the need to dress break down (?); how is the representation of the self realized today in the digital age and how are belongings made explicit (?); how do we recompose the relationship with the context that is not only social and cultural, but of the human immersed in the virtual dimension and, despite everything, at the opposite in the natural one (?); furthermore, bio-digital couture can constitute a fruitful ambivalence to access a new paradigm (?). Questions that arise within the critical reflection to contemporary society, to the forms of civilization that are explicated in as many forms of government, and of models of design and production inspired and guided by the lead to time productivity paradigm that pursues the creation of surplus value that is not distributable, not accessible and, at best, generator of inequalities, otherwise conflicts. The investigation of the multiplication and complexity of the socio-political-economic system,

as we experience, implement and perceive it today, includes another dimension; from the more sensitive one, of experientialization that sets in motion emotional levers with a strong appeal to a different degree of perception of ourselves and the environment, to those, now widely tested, referable to the neutral acceptance of the countless challenges of daily living. It runs the obligation to equip ourselves with new tools of field investigation and speculative/imaginative observation in order to recover a margin of critical construct that places ever ahead in a plausible future, man's ability to prefigure, to predict, to formulate worlds, to behave as a mystical futurologist or better yet a reliable prescientist about the fate of man on earth. From the side of reflection and critique of the current model of life and development, the heterodox narrative proposes new methods of indoctrination, understood as a profound reconnection of man to nature acting in the psychological sphere, representing new possible approaches.

The human-nature relationship is widely described as diriment and headed for a sharp caesura (Beery et al., 2023), tells of the tearing of ties, the devastation of ecosystems, and the impoverishment of the ethno-zoo-botanical genetic heritage. The foreshadowed scenario outlines a scope for reflection on survival by reflecting, on the one hand, on the heralded disappearance of humans on earth, issuing a call for human persistence; on the other hand, on the role of restorative through tools for elaborating new thinking that requires an awareness that goes beyond data and statistics (Antonelli, 2019).

The reaction to the current crisis takes various forms; repairing the lost human-nature link and identifying interventions requires an anthropological shift that brings the new approach of doing to purposes closer, foreseeing each and every effect (Van Gelder, 1996).

On the other hand, the reliable prescientist bases his or her imaginative knowledge on premonition fueled by the imagination as an experienced futurologist; in psychology these are called "self-fulfilling prophecies" (Merton, 1971) and lead to finding and interpreting data so that our expectations are met, enabling us to act positively, to raise the level of awareness.

The matrix of self-fulfilling prophecy responds to the identification of a purpose that motivates the achievement of a positive outcome (Heidegger, 2016), in this case with a strong emphasis on premonition of the effects that correspond to those causes.

## The Limits Imposed. Anthropogenic Mass

Design looks at "real people" (Antonelli, 2012) is developed in a collaborative environment with experts from all fields, ready to test their theories and, thus, with the activation of critical thinking to re-locate new constructs. Paola Antonelli in her essay "Vital Design" (2012) asserts that design is about "life" and ensures, in an era of great technological acceleration and as many crises extended from the environment to politics, greater attention to human beings, reconstructing their essential values.

The ability to collaborate to produce critical thinking about the current state of the human-nature pair introduces an intricate concept of collaboration and for that matter one with more complex implications that track the goal. Critical thinking reflects on human beings on their role, and not being alone, their actions have effects to be anticipated and anticipated with each process that is intended to be undertaken.

Ultimately, a new way of creating value moves from deep, critical and evolutionary thinking, embraces adaptive doing, orienting to continuous regeneration of equilibria, establishes a relationship of mutual cooperation between artificial systems and living, sentient beings. The irrationality of the current model, according to some authors

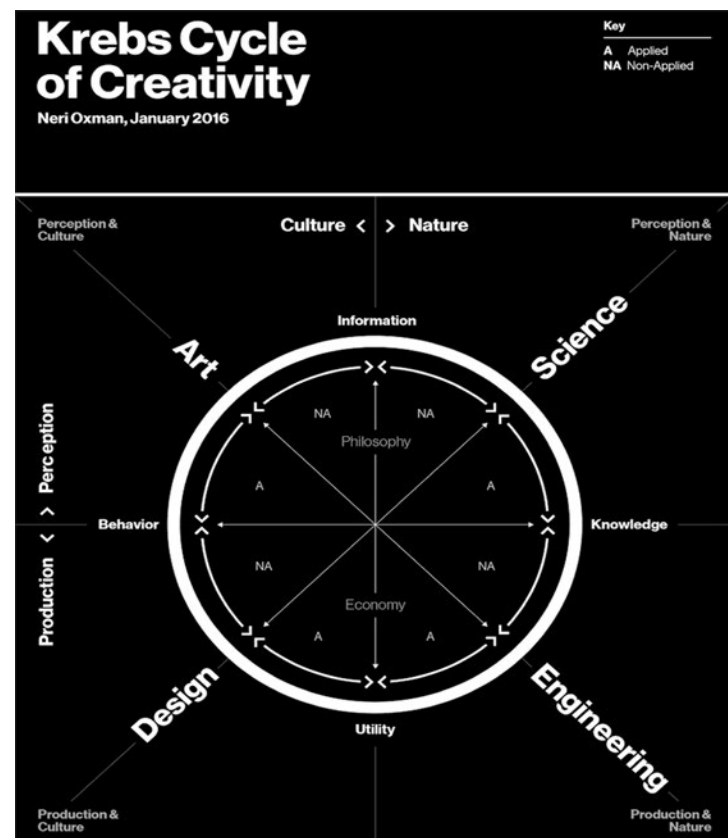


Fig. 01





Fig. 02

(Lagioia, 2022), is self-evident, and in the face of incontrovertible data on the, by now, ascertained dangerousness of human action, believing that the current model of development is unique and irreplaceable, does not mean that procrastinating its end, does not mean that this will never be written or, worse yet, never proven.

The issue arises from the intense research activity that results in profound debates on the evidence of irrefutable scientific data testifying to irreversible ecosystem transformation processes that, on the contrary, must be kept in balance and for which initial values must be reconstituted as much as possible. Humanity has become a dominant force in shaping the Earth to such an extent that

the pressing question is how the overall material production of human activities compares with the overall natural biomass. “Here we quantify the mass produced by humans, called the anthropogenic mass, and compare it with the total living biomass on Earth, which currently equals about 1.1 teratone 10.11. We find that Earth is exactly at the crossover point; in the year 2020, the anthropogenic mass, which has recently doubled roughly every 20 years, will exceed all global living biomass. On average, for every person on the globe, an anthropogenic mass equal to more than his or her body weight is produced every week. This quantification of the human enterprise provides a quantitative and symbolic characterization based

on the human-induced mass of the Anthropocene” (Elhacham et al., 2020.). For the first time in the history of our planet, human-designed constructs-materials, products, and the buildings-exceed the entire terrestrial biomass. “Although humans are part of the natural world, human activity and the “goods” we design and build-from our clothes to our cities-have increasingly set us apart from nature, negatively impacting ourselves and our planet” (Oxman, 2020).

### **Unorthodox Approaches. The Interwoven Knowledge Movement**

Based on the assumption that the current model of knowledge is interdisciplinary that is based on a clear integration of collaborative disciplines, at the opposite end of the spectrum, the “anti-disciplinary” or interwoven knowledge model is at the antipodes: “it is about working in spaces that simply do not fit into any existing academic discipline, anti-disciplinarity is a specific field of study with its own particular rules, frameworks and methods” (Ito, 2016). It substantiates the hypothesis that integration between Design and

other disciplines, including Science can take place in an “antidisciplinary” way, in order to configure a rigorous yet engaging model that thrives, making an original and unorthodox contribution. Since 2016, Ito has been investigating the possibilities inherent in an “antidisciplinary” approach as a direct consequence of the mutualistic approach of creative-technical-scientific disciplines, proposed in Neri Oxman’s Krebs Cycle of Creativity (2016) [Fig. 1]. Significantly, the slogan with which the recruitment of MIT’s Media Lab is carried out, in fact it is based precisely on the dialectic between the disciplines that does not find a point of contact, because this simply does not exist, quotes, “if you do not fit into any existing discipline either because you are between disciplines or simply beyond traditional disciplines (...), come to the Media Lab only if there is nowhere else to go. We are the new Salon des Refusés.” (Ito, 2016). In the face of a non-location, almost of rejection from the established interdisciplinary establishment, the image of the space of antidisciplinarity is represented through dots that emerge from a white substrate and can be translated into isolated but closely related dots; they find their place in the heterogeneous humus where



Fig. 03

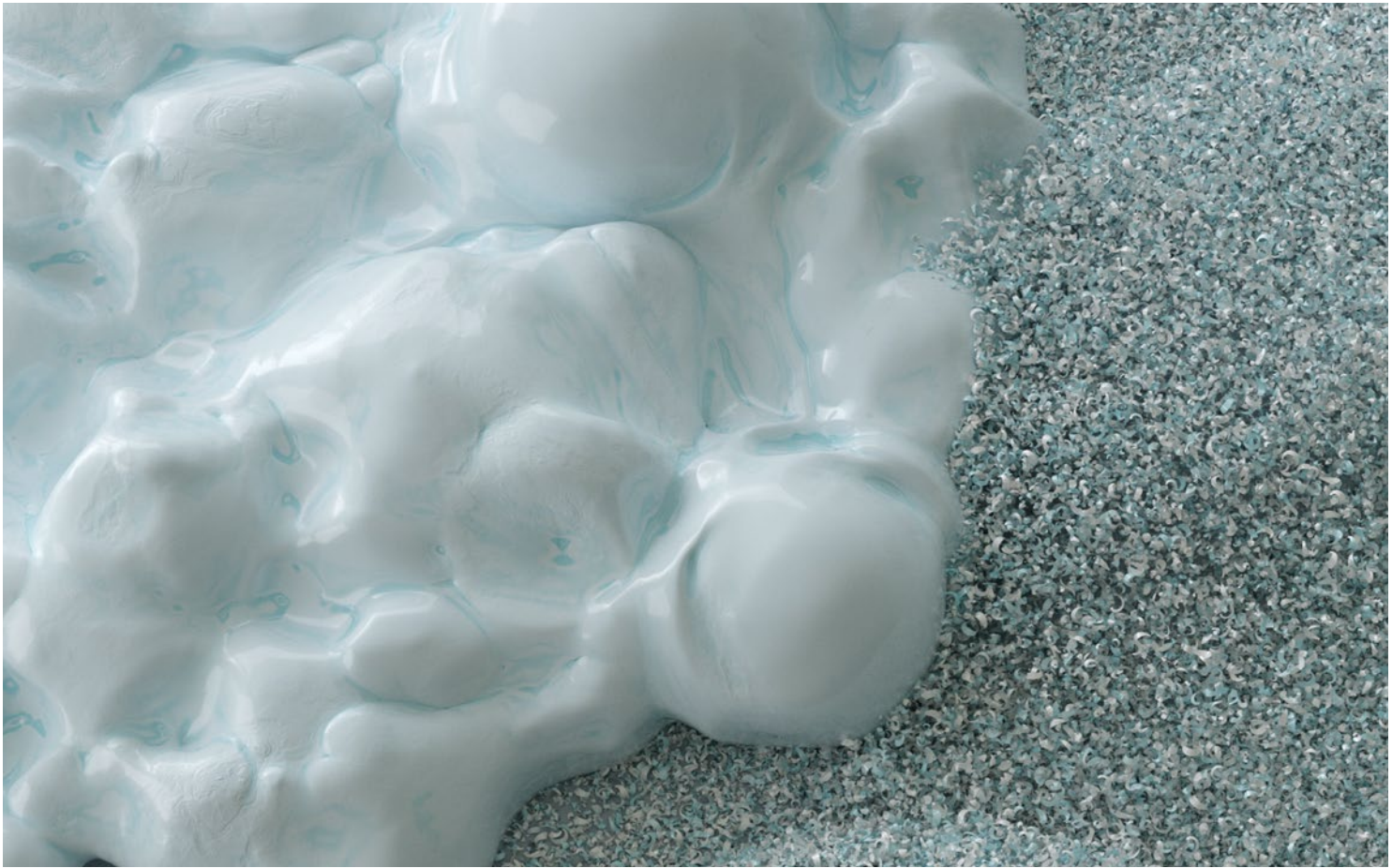


Fig. 04

they were generated that plays the role of condenser and medium of diffusion. The representation of the space of antidisciplinarity makes use of the following image: “When I think of the ‘space’ we have created, I like to think of a huge piece of paper representing ‘all science.’ The disciplines are little black dots on this white paper. The huge amounts of white space between the dots represent the anti-disciplinary space” (Ito, 2016). The available white space has the essential characteristic, in addition to anti-disciplinarity, of a kind, of “de-specialization,” the black dots represent anchors, where the placement of disciplines, understood in the current way, finds an uncertain, voluntarily fluid and variable placement, dependent on time rather than space. The urgency of dealing with complex problems often referred to as wicked problems, requires a substantial effort in redefining the approach, which, of course, cannot exclusively satisfy the condition of interdisciplinarity. The hypothesis in terms of the scientific approach is geared toward defining a collaborative model as opposed to the proliferation of approaches that make up a complex mosaic of so many different disciplines. Often, spatially and temporally interconnected disciplines that do not clarify the

terms of the same problem when investigated from another point of view, by virtue of an approach that derives from a substantial orthodox operational tool setting and for that reason unavailable to participation.

#### Design of ‘Reverse’ Matter

Various design approaches make their way, from materials innovation, to creative technological exploration, to speculative design, a great convergence of intent and vital energies emerges from different disciplines explored by design. In materials innovation, virtual reality used for the visualization of certain ‘concept-materials’ concretizes a new design thinking that responds to an ‘inverse’ process to the customary practice of the design process. Custom follows the model from design, to prototyping, to choosing materials or the best configuration to produce, use and communicate it, and eventually recycle it; the nonlinear model reverses the perspective. The process goes backwards, stemming from an overall idea that is structured into a digital (parametric) matrix that simulates matter in different stages and related configurations from: a prediction of its decomposition to

dematerialization; from the creation of matter-second from reprocessing waste; from a concept of hybrid biological and technological structures, through proliferation and mutualistic growth; from data that is organized according to purpose and informs matter (informed matter). The perspective, then, is the regeneration of natural and artificial cycles that define its purposes and intentions. In the first instance, a kind of ‘virtual raw material’ is developed, which retraces by visualizing it, the whole process, according to one or more of the previous options and subsequently materializes into an object or artifact that contains one or more results, descended from those design intentions. This is the *matière brute* that arises from a deep understanding of processes; it is an ‘inverse raw material’ that has undergone, ideally or rather virtually, all the processes of an ordinary raw material (in the old logic point of departure), observes the memory of it, and is therefore designed to reconnect man and his actions to the regeneration of natural-artificial cycles of matter and energy.

So many are the approaches of designers, critics, creatives, and researchers who walk through one or more options/intentions in their projects, we

highlight, among the most significant examples, some common traits; the critique of the current production model and especially the development of a reflection that goes beyond sustainable, or conscious behavior and beyond approaches to circularity and resilience of systems, in order to reproduce ancestral mechanisms that adopt the molecular dynamics of the living.

#### Biodesign

Neri Oxman pursues the path of “matter cultivation as an alternative to assembly” this mode pursues the idea that natural systems can establish a close dialogue with human technology (digital soft) and help develop living systems from an artificial matrix and vice versa.

The idea of a bio-digital age, where “the confluence of computational design, additive manufacturing, materials engineering and synthetic biology is programmed, enables the creation of new generations of materials” (Oxman, 2016a, 2016b) [Fig. 02]. One finds here the concept of matter generated and re-generated through the concrete co-evolution of the biological living with the engineered artificial. In co-evolutionary processes, the biological matrix is grafted onto an artificial



Fig. 05a

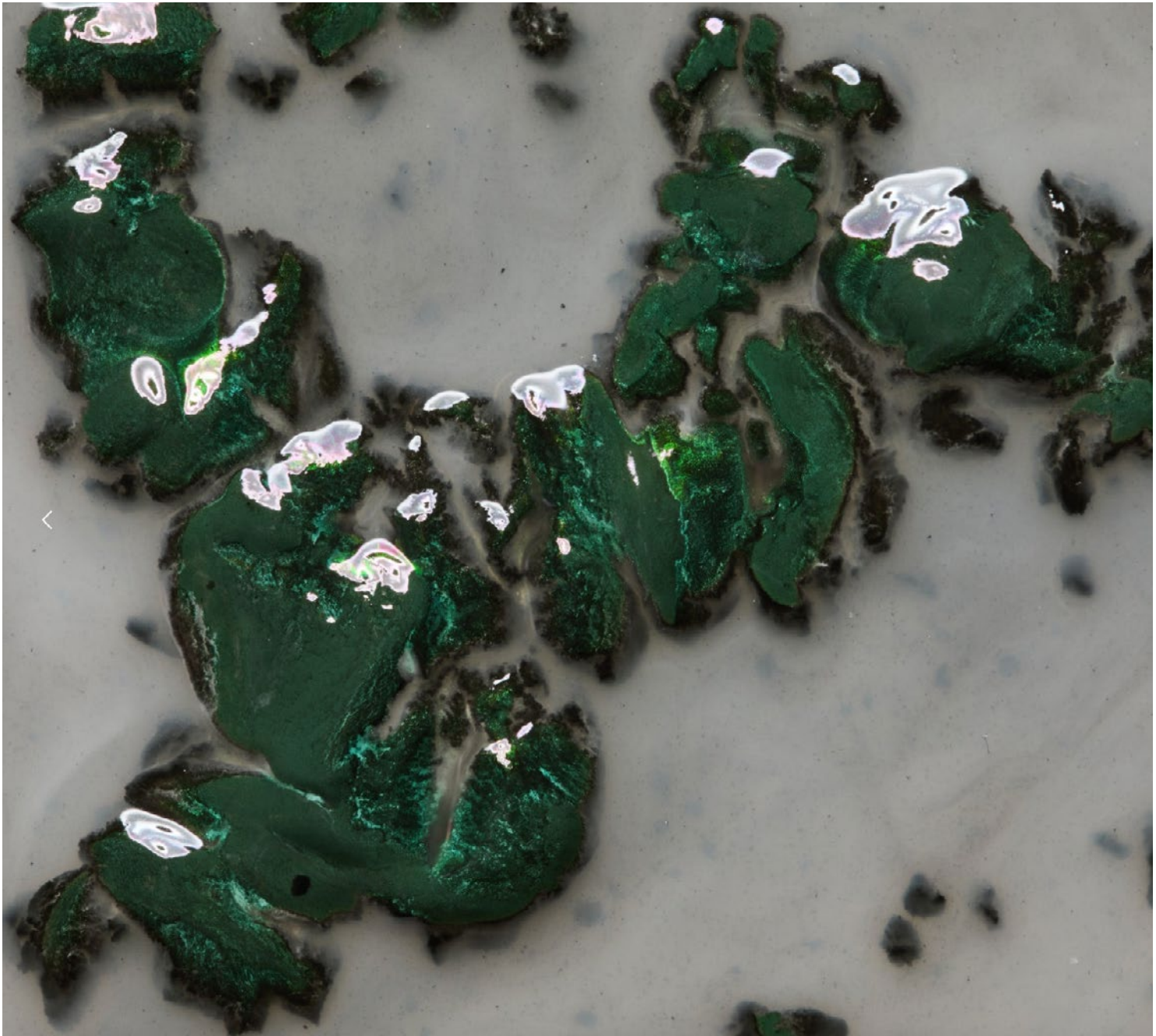


Fig. 5b

material or structural matrix that provides direction and naturally intertwines the two works concordantly. It is, albeit of co-evolution, to intervene in time, in the design capacity to predict the response of biological growth adhering to the technological structure.

United Matters (English collective)

The English collective starts from a variety of design approaches to provoke people to change the way they live in the real world. The change in recent decades focuses on social and cultural issues to promote more sustainable development. In manufacturing, companies are moving with different speed and intent in adopting and

petroleum-based materials and processing to the point of producing technically advanced products. “Cells are like tiny factories. They have evolved over billions of years to have highly specialized functions (Rutherford, 2013). By designing living systems, we can apply the technologies that nature has perfected and adapt them to today’s needs” (United Matters, 2023) [Fig. 03].

Subframe Studio

Subframe Studio proposes digital visions and material constructs grounded in the narrative of production processes in various fields of action, the contribution is innovative, creative and often imaginative of reality such as it is presented and

envisioned. The future for Subframe Studio is at hand, the construction of the image is a digital fact programmed to provide answers to change, and above all, inspired by virtual reality, it encourages design with advanced intentions.

New materials take shape from ancestral matrices, others from raw-second materials from waste and related industrial processes of transformation and reuse, designs that predict behaviors in response to a set of external stresses, ultimately represent the creation of materials and configurations of digital objects whose growth and response is visualized [fig. 4]. Being spaces of possibility, the criterion is to imprint them with internal and external conditions and adaptability to tools and environment.

Among the thought-provoking projects for visual, design and construction impact, a significant application has been made in the area of Fashion for which, it becomes clear how much distance exists between the custom and habit of Fashion design to that animated by artificial intelligence.

Subframe Studio for Vollebak builds movies about inanimate nature inspired by the project “From the First Clothes Built for Mars, to Gear Built to Outlive You” (<https://vollebak.com/pages/ranges>) [Fig. 5].

The experience of the one becomes a mode of storytelling for the other, so that the creation and production of extremely high-performance garments arises from a transfer of knowledge to technologies from fields far removed from Fashion: “Everything they use is so durable that it was originally used as bulletproof vests, ballistic armor for vehicles, mooring systems for giant container ships, and ropes used to tie down oil rigs in violent, icy seas. The goal was to show the selected minerals in a creative, abstract way highlighting the characters of each. We focused on celadonite, hematite, ochre and volcanic soil and created four short films” (Subframe Studio).

For its part, Vollebak<sup>1</sup> transfers knowledge to heterogeneous materials in its design and production know-how for advanced clothing: “Our clothing addresses the fundamental challenges we will face in the next century: from extreme heat waves, floods and fires, to resource scarcity and space exploration”.

<sup>1</sup> <https://vollebak.com/pages/ranges>

## Conclusion

In brief, a few points have been highlighted. Reacting to the complex crisis we experience nowadays starts with a substantial anthropological change that brings the new approach of doing to purposes closer, foreseeing each and every effect. Acting with the effects of every intervention in mind will be the perspective of every action; replacing the anthropocentric model of productivity with a new way of creating value moves from deep, critical and evolutionary thinking.

The assumptions are realistic and, above all, possible: adaptive doing, oriented toward continuous regeneration of equilibria, establishes a relationship of mutual cooperation between artificial systems and living, sentient beings. The paradigm of orientation is referable to some experiments illustrated in the text that respond to the following reflections on production and processes, focused on future materials: a prediction of decomposition to dematerialization; from the creation of matter-second from reprocessing waste; from a concept of hybrid biological and technological structures, through mutualistic proliferation and growth; from data that are organized according to purpose and inform matter (informed matter). The possible perspective falls within the logic of corresponding regeneration between natural cycles and artificial cycles and which define their productive and use purposes and intentions.

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#### Figure Captions:

Fig. 01: The Krebs Cycle of Creativity (KCC) is a map describing the perpetuation of creative energy (creative ATP or "CreATP"), analogous to the Krebs Cycle proper. In this analogy, the four modes of human creativity - Science, Engineering, Design and Art - replace the carbon compounds of the Krebs Cycle. Each of the modes (or "compounds") produces "valuta/currency" by transforming into another. From the essay, *Age of Entanglement*. Neri Oxman, 2017.

Fig. 02: The masks in *Vespers III* are habitats for microorganisms and sites for the creation of new life. The third series revolves around death and rebirth, denoting both spiritual incarnation and biological recapitulation. To create the *Vespers III* masks, novel tools and techniques were developed that enable tight integration between, and control of, designed and biologically derived properties. By combining living and non-living materials using 3D printing and synthetic biology, they are creating new categories of materials, termed Hybrid Living Materials.

Research team: C. Bader, R. S. H. Smith, D. Kolb, S. Sharma, J. Costa, J. C. Weaver. Prof. Neri Oxman. Design Museum, 2018, London, United Kingdom. National Gallery of Victoria, 2018, Melbourne, Australia.

Fig. 03: *Next Nature*. 'Sculpting with Air' explores design through mycelium foam. The raw materials collected for this project comes from agricultural wastes: corn husk and hemp. Under the conditions of high humidity, high carbon dioxide, proper temperatures and airflow running constantly, a foam-like element is formed and can be used as a material. The project provides another way and opportunity to work with living materials by harnessing the growth instead of fitting them into moulds. Lars Dittrich (icw Eveline Peeters and Simon Vandelook). 2022:

Fig. 04: Subframe for Adidas makes PRIMEBLUE project provides story about ending plastic waste.

The challenge will be how we educate the public as to how PRIMEBLUE is solving the problem. That means showing how the material is made, the technology used, and the final product come to life through seamless, well-composed, live action shots and gorgeously crafted visual effects.

"We were working in close collaboration with Bemo Studio to produce CGI concepts, key visuals and animation as well. Through CGI, we'll tell the important story of the process capture. How we collect the plastic, crush it, wash it, dry, shred, melt and thread it. Since this process has never been seen before, we'll need to create a visual canvas that clearly illustrates the technology. Think stylized and dynamic shots of a piece of plastic being broken down into its simplest elements then transformed into something else entirely. Additionally, the sequence needs to flow where each step hits on the beat like a well-oiled machine".





# **SHAPING RESEARCH**

# MEATY MAGS AND FLEESHY FILMS

## OBSERVING THE MORPHING BODY OF TEXT IN FASHION VISUAL CULTURE

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**Competing Interests:** The Author(s) declare(s) no conflict of interest

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## Abstract

This paper addresses the topic of transformation identifying written text as a living body, ultimately suggesting that the corporeal qualities of textual matter function as an interpretative tool for unpacking new and unexpected fashion imagery. Through the observation of three fashion films dating between 2005 and 2020, as well as relying on a firm theoretical framework based on the analysis of Roland Barthes' seminal volume *The Pleasure of Text* (1973), the research discusses the role of written discourse in contemporary fashion communication, highlighting its performative and erotic traits and how these inherent properties interreact within the field of fashion visual culture. Fashion moving image is therefore seen as the context in which—and with which—the body of text seductively moves, mutates, and merges to unveil unprecedented visual scapes.

**Keywords:** Fashion Visual Culture, Text, Body, Visual Studies, Fashion Film

## Introduction

The notion of referring to a piece of written material as a body of text is familiar to all, as it is a common expression largely used to indicate the central parts of a publication, a book or other compositions of words and phrases. Therefore, text and the ever-changing crossbreeding of its cells—which are in fact the letters of the alphabet—are frequently, and often unknowingly, charged of bodily qualities and a corporeal dimension (Bacon, 1620). Starting from this assumption, the research unpacks the definition of text offered by Roland Barthes in the volume *The Pleasure of Text* (1973) and applies this theoretical framework to the realm of fashion visual culture, specifically through the study of fashion film. By observing both written material and moving image across the same complex of notions, the paper not only identifies a shared array of anatomical features, but also highlights mutual tensions and performative qualities, such as the drive towards desire, pleasure, and subversion (Barthes, 1973).

If on one hand text could thence be analysed as a living and breathing system, on the other, fashion almost inherently implies the idea

of a body, featured for instance in its materiality (Emberley, 2007), representation (Smelik, 2006), projection (Eco, 1985) or absence (Jonkers, 2019). Even more so, fashion films necessarily entail the presence of a body of some sort and are considered as the ideal visual space in which the body can move freely, interact, and ultimately express its physicality through fashion (Amaducci & Manca, 2021). By considering both the corporeal properties of text and those implied by fashion films, the paper analyses three case studies illustrating different modalities in which the physical encounter between the body of text and that of moving image activate original cultural interpretations and, in doing so, inform fashion visual culture with unexpected points of view.

## The Anatomy of Text

One of the first investigations that trace a clear and profound link between the intricate apparatus of text and that of fashion visual culture is the work of renowned semiologist Roland Barthes, whose seminal volume *The Fashion System* (1967) questions the relationships between written

material and fashion imagery (Barthes, 1953), applying a theoretical approach on language to fields of study such as fashion communication and promotion.

In his 1973 volume *The Pleasure of the Text*, Barthes pushes the research further, disclosing the bodily traits of text (pp. 11-12) and ultimately defining written discourse as a complex system characterized by a fluid, protean and cumulative nature. In the study, the semiologist in fact differentiates the “text of pleasure” from “the text of bliss” (p. 14), attributing different abilities and levels of access to each. The first, in fact, is described as an extension of the dominant culture and therefore is experienced by “a comfortable practice of reading” (p.14), while the second is characterised by its power to jeopardize systems and its faculty to “impose a state of loss, [...] discomfort and unsettlement to the reader’s historical, cultural, and psychological assumptions” (p.14), ultimately generating upheaval through the practice of reading.

According to Barthes, the goal of written text is therefore to transport the reader into the realm of pleasure and bliss, and to do so it must trigger the status quo by adopting the restlessness of language (p. 6). Thus, for Barthes, it is precisely the heterogeneous escamotages of language—be them narrative, lexical, or stylistic—that confer to the body of written text a more tangible, visible, and performing set of properties. In particular, the semiologist defines the tension that binds the body of the reader to that of written material as a carnal bliss, an orgasmic desire consumed through the fetishist observation of its various anatomical parts. According to the semiologist: “The text is a fetish object, and this fetish desires me. The text chooses me, by a whole disposition of invisible screens, selective baffles: vocabulary, references, readability, etc.; and, lost in the midst of a text (not behind it, like a *deus ex machina*) there is always the other, the author” (p. 27). The powerful bond between written discourse and the corporality of the reader is therefore described as varied and inconsistent. By establishing a performative and fragmentary relation expressed through appropriations, cross-references, narrative structures, lexical choices, homages, and virtuosity; the text feeds the reader’s desire following a syncopated, broken and, indeed, fragmentary rhythm. “Is it not the most erotic portion of a body where the garment gapes? In perversion (which is the realm of textual pleasure) it’s the intermittent [...] which is erotic [...] the staging of an appearance and disappearance”

(pp. 9-10), Barthes concludes. In this light, the practice of reading emulates that of edging, through which the reader is kept constantly on its toes due to the ever-changing and sudden nature of written text.

In the seminal book *Cartamodello: Antologia di scrittori e scritture sulla moda* (2000), the Italian writers Vittoria Caterina Caratozzolo and Paola Colaiacomo investigate fashion culture through written extracts and quotes of key theorists, also documenting a relationship of tension and inconstancy in the practice of reading. In the introduction of the volume, Colaiacomo describes the act of reading as “a schooling in the discipline of ellipsis. A training to bear the suspension of meaning, between one word and another, between one verse and another, between one chapter and another” (Colaiacomo, 2000, p. 14). Reading implies the desire to strive for completeness, which is however out of reach due to the polymorph and infinitely dense nature of the text. What the reader encounters is therefore a composite landscape (Deleuze, 1995), a panorama, a constellation of imaginaries that satisfy or not the search for pleasure in a fetishist and utterly physical way. Since written material—with its own set of references, appropriations, styles—is by nature lumpy and uneven, then also the practice of reading becomes a discipline to an unstable, perhaps even unattainable, kind of pleasure.

### **Text and the Fashioned Body**

As previously introduced, the presence of a body is almost inherent in the discipline of fashion. The material, creative, and cultural practices that regulate the fashion system are in a way programmed exactly for this purpose: to cover, reveal, and reimagine human features. When not worn, clothes are in fact a document of the absence of a body, when inhabited, however, they become the visual manifestation of its presence, a corporeal extension of that same body which has historically been defined as in or out of fashion (Emberley, 2007) by seasonal collections, campaigns, and fashion writing.

Through the concept of the “fashioned body”, scholar Kim Sawchuk affirms that, though fashion, the body becomes “an embodied subjectivity, constituted in the rich weave of social, historical and cultural inscriptions” (Sawchuk, 2007, p. 478). The fashioned body is therefore inherently



Fig. 01

fragmented, composite, and restless, holder of innumerable narratives and interpretations which stimulate a compulsive—and often unattainable—quest to its complete unpacking and comprehension. Thus, both textile and skin seem to share the same fluidity, vagueness, interplay, and intertextuality (Rocamora & Smelik, 2016, p. 257) typical of the body of text enunciated by Barthes. In the seminal article *Fashion and visual culture* (2006), Anneke Smelik extensively investigates the dynamics that regulate fashion media in the age of postmodernism, lunging also into the study of the intertextuality intrinsic to fashion imagery, the fashioned body, and visual pleasure. “Another postmodern feature is intertextuality, which amounts to the idea that a text always refers to other texts. [...] This term does not, of course, simply represent a narrow view of text; images likewise ceaselessly refer to each other” (Smelik, 2006, p. 157) states Smelik, specifying that “a large part of visual pleasure in contemporary culture is based on recognition: the more references you can place, the cleverer you feel as a viewer.” (Smelik, 2006, p. 157). Within the field of study of fashion visual culture, also researcher Paul Jobling states that “the meaning of fashion is a matter of

intertextuality between word and image” (Jobling, 2016, p. 139), ultimately suggesting that fashion images, just like Barthes’ definition of the text, are compound fantasies that feed the consumer into the dimension of an incomplete and fetishist pleasure. Though these lens, within the realm of fashion visual culture, both the fashioned body and written text could be capable to inform each other and, in doing so, create innovative visual imageries inextricably linked to the concept of pleasure and desire.

To establish an ever more profound relation between the body of written text and fashion imagery, we could further argue that fashion film encapsulates at best all the anatomical properties introduced by Barthes. Fuelled by the interplay of different authors and subjectivities—like those that distinguish fashion magazines (Marcadent, 2020)—fashion films are a highly fetishist media, studded by countless references, vocabularies, glossaries, allusions, and grammars. Deeply discussed by fashion researcher Marketa Uhlířová in her article *100 Years of the Fashion Film Frameworks and Histories* (2015), fashion film—a term introduced in the early 2000s—is in fact defined as a “medium [...] adept at recasting consumption as seductive

visual entertainment,” (p. 140). If we intend to read fashion films under Barthes’ lens, it is precisely those agglomerations expressed within the fashioned body present in fashion film that desire us and that unleash in us that same fetishist quest for pleasure distinctive of the text.

### **Case Studies: Sentient, Erotic and Dissident Bodies**

Distinguished by its cross disciplinary nature and its natural receptiveness to any technological and aesthetic stimuli (Amaducci & Manca, 2021, p.80), as well as its intrinsic correlation with the realm of pleasure, contemporary fashion film could be an ideal field of research in which analyse the morphologies of the textual body. By selecting three case studies, dating from 2005 to 2020, in which the presence of the fashioned body as defined by Sawchuk is evident, it becomes clear how the presence of the body of text influences innovative implications of fashion in visual culture.

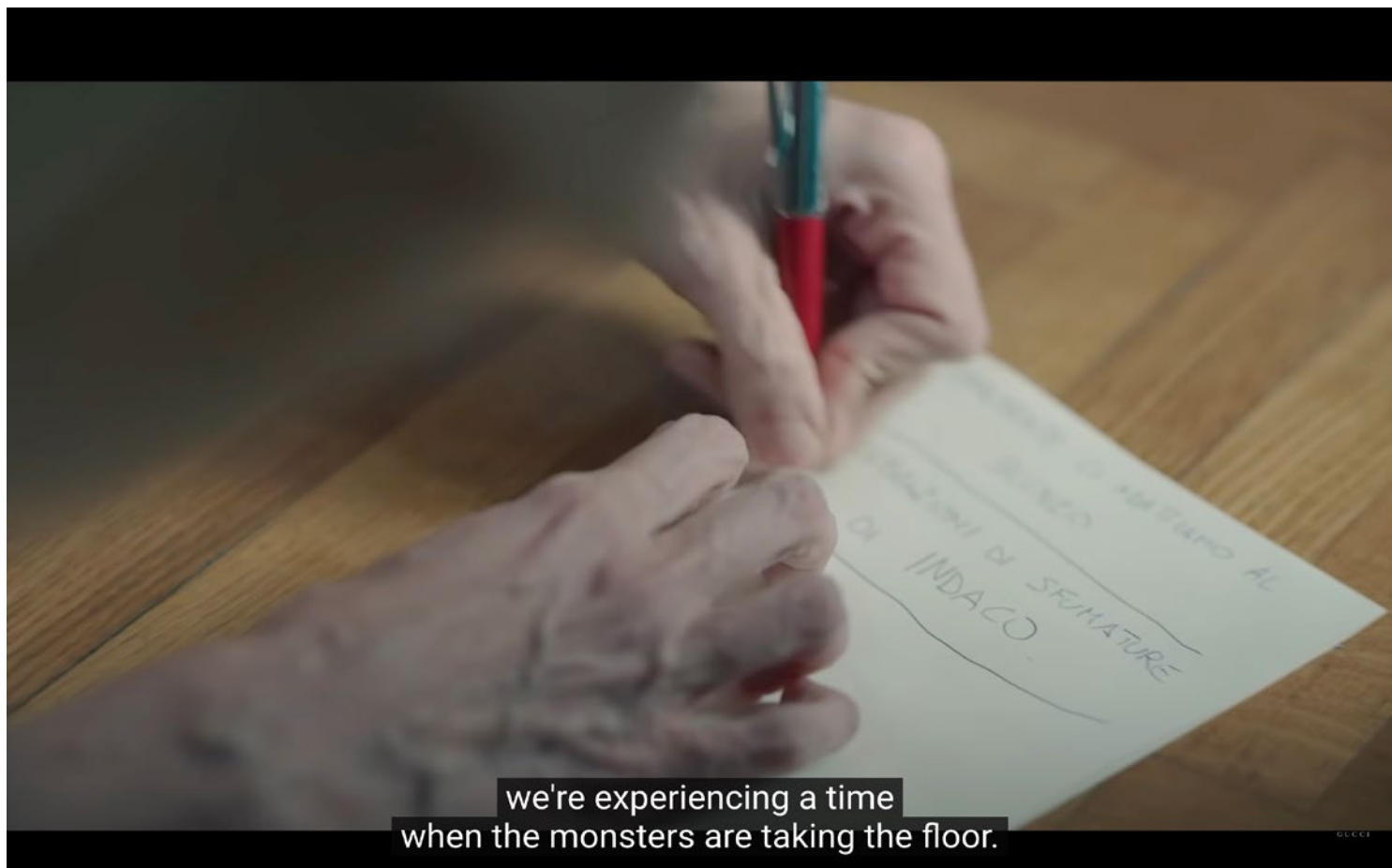
A significant case study that highlights this phenomenon could be the video submitted by renowned fashion photographer Tim Walker for SHOWStudio’s brief *Moving Fashion* (2005), inspired by his editorial *Timeless* featured in the December 2005 issue of *Vogue Italia*. The film welcomes us with an aerial view of a blown-up version of the November 1st, 1949 issue of *Vogue US*, on the cover of which stands out a photograph by Irving Penn portraying his life partner and model Lisa Fonssagrives wearing a flowing red dress and contrasting black gloves. The pages of the immense magazine are gradually leafed through by a faceless figure until we see the actress and star of the *Vogue Italia* editorial Hannelore Knuts lying among the gigantic *Vogue* spreads, from which she subsequently emerges by detaching herself from the paper support. Both the film and the images published in *Vogue Italia* can be interpreted as a metaphorical transposition of the corporeality of Barthes’ text of bliss, which interacts with the fashioned body—that of the living model, but also that of Fonssagrives—conveying a sense of tactile intimacy. In the film, the protagonist of the printed editorial comes to life and with her also all the articles, captions, and cultural references of the *Vogue* issue, shown here as a massive, out of scale, almost looming entity, but also as a body capable of embracing its contents, the body of the model, and, maybe, the reader’s as well. In this case, the physicality of the text is expressed through

its sentient activity and its highly attractive and magnetic nature. The body of text is therefore here seen as dynamic and performing, capable of interacting with, attracting and enclosing other bodies though the upheavals dictated by its sudden movements. The consequence of this encounter is the establishment of a high charge of tension to desire.

Another pertinent example that highlights instead the more fetishist and erotic aspects of the body of text could be the fashion film directed by English photographer Nick Knight for the audiovisual and performance project *Transformer* launched in 2002 on the digital platform SHOWStudio. In the film *Eat Fashion* (2002), the British model Erin O’Connor stages the act of consuming fashion through savouring a banquet of magazines, a practice that induces the model’s body to visibly transform and morph. At first dressed in a light and transparent little black dress, the model approaches a pile of magazines in a nonchalant and relaxed way, a tower from which she passively begins to tear pages and taste them slowly. As the film continues, we see O’Connor feed more and more voluptuously on these pages, a crescendo conveyed also in the increasing number of garments that cover



Fig. 02



we're experiencing a time  
when the monsters are taking the floor.

Fig. 03

the performer's body. The greed for magazines is also supported by other gestures, such as the placing of torn pages under the stratified clothes: a padding that deforms O'Connor's body which is progressively submerged and encapsulated by heavy layers of fabrics and printed paper. At the end of the video O'Connor is visibly tired—her figure visibly distorted by binge eating fashion printed media, as if some form of life was born from this encounter and is expanding from the womb of the model. The fashion film in question could be seen as a transposition of the practice of reading, an operation previously described as driven by a fetishist desire for completeness, an orgasmic but only partially satisfying practice. The obsession with the consumption of text and images resonates in the bulimic gestures of the model, who can't help but swallow the huge quantity of references, imaginaries, and narratives that end up occupying her body and stretching it both from the inside and, symptomatically, from the outside. One last example that reveals the morphologies of written text could be the cultural operations that the creative director and designer Alessandro Michele outlined for Gucci since 2015 up until his recent departure from the brand in 2022. Michele's

work is deeply influenced by written material (Socha, 2020) and tries to elevate the inspirational and informative nature of text, well as for its ability to come alive, mutate and morph. This is greatly exemplified in most of the episodes of the mini-series directed by filmmaker Gus Van Sant in 2020 for Gucci titled *Overture Of Something That Never Ended*, studied not only by the presence of Italian performance artist Silvia Calderoni, but also by that of written discourse. In the first episode *Home*, for instance, Calderoni is seen preparing for the day in her Roman house while, on a television screen in the background, Spanish writer and philosopher Paul B. Preciado gives a lecture that touches upon the systemic violence and regulations of the body across the centuries. "This revolution is going to be about love. It's going to be a matter of changing desire, of transforming desires," states Preciado directly addressing Silvia through the screen, a phrase that inspires the performer to take a small piece of paper and write a few poetically charged notes, diametrically opposite in style to the clear and lucid words spoken by Preciado but rooted in the same aspirations of a social revolution. Considering that both Silvia Calderoni and Paul

B. Preciado are militants of this revolution, being an active part in practices of resistance and inhabiting dissident bodies, in this case the written notes are ever more charged of corporeal qualities, becoming not only an extension of the protagonists' flesh, but also a dense clot of a identities, memories and experiences. In the volume *Fashion Film* (2021), when describing the series signed by Van Sant for Gucci, writer Eleonora Manca directly quotes Francesca Alfano Miglietti: for Manca, the series is an example of *cadavre exquis*, “a body as a shock and tangle of messages, languages, [...] a body that changes its appearance to better adapt to the present chaos.” (p.89). In this instance, written discourse moves and shifts in chaos, it a utopia (Foucault, 2014 [1966]), a terrain of multiplication and trespassing (Manca, 2021, p.89) that stretches from Preciado's words to his body, to that of Silvia and finally on the white page, blossoming throughout the movie and constituting a multitude of bodies and identities.

## Conclusion

What emerges from the paper is firstly the intertextuality that defines “the text of bliss”, as described in the literature review of Bathes' seminal volume *The Pleasure of Text* (1973). After analysing the bodily traits of text—which are defined as inconsistent, performative, and restless—the paper then observes how the composite nature of written material extends from the page into the scope of human experience, triggering a quest for pleasure and completeness.

The qualities of text are then compared to those identified in fashion as a system of meaning, especially to the concept of the “fashioned body”, a fragmented physicality which can be elevated through fashion film—being this media also mainly characterised by intertextuality and its tension to visual pleasure. As the case studies analysed demonstrate, written text and the fashioned body presented in fashion films share the same fragmentary, cumulative, and restless matrix and are highly performing bodies of meaning, whose actuations are conveyed by a common tension towards a fetishist pleasure for completeness and subversion.



Fig. 04



Written text and the fashioned body are in fact understood as highly composite and attractive devices, capable of embracing other entities, as in the case of *Moving Fashion*, establishing an erotic and fetishist relationship, as in case of *Eat Fashion*, or becoming the vehicle for morphing new identities as we have seen in *Overture Of Something That Never Ended*. The relationship between text and the fashioned body could therefore be interpreted as an encounter between a plethora of physicalities, an all-encompassing experience that affects fashion visual culture stimulating new and unexpected interpretations. Finally, the research demonstrates that, when in the realm of fashion film, the body of text mutates and merges with its surroundings, triggering the creation of innovative visual and symbolic panoramas.

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## Figure Captions

Fig. 01 *Timeless Walker T.* (2005, December) *Timeless* [Spread], *Vogue Italia*. Model Hannelore Knuts poses with a huge replica of *Vogue US* November 1, 1949. From: CLM Agency - Simon Costin <https://www.clm-agency.com/set-design/simon-costin/vogue-italia-tim-walker-7>

Fig. 02 *Eat Fashion Knight N.* (2002, September 19) *Eat Fashion* [Polaroid], SHOWStudio. Model Erin O'Connor covered in clothes and pieces of paper eats from a metal shopping cart full of fashion magazines. From: SHOWStudio, London, UK. <https://www.showstudio.com/tags/erin-oconnor>

Fig. 3 *Overture Of Something That Never Ended* Van Sant G. (2020), *Episodio 1: At Home | Silvia Calderoni e Paul B. Preciado | Overture Of Something That Never Ended* Brief description [Screengrab]. Performer Silvia Calderoni takes notes on a white piece of paper. From: Gucci Fest/YouTube. <https://www.youtube.com/watch?v=zKqbG6TLYnc&t=528s>

Fig. 4 *Overture Of Something That Never Ended* Van Sant G. (2020), *Episodio 1: At Home | Silvia Calderoni e Paul B. Preciado | Overture Of Something That Never Ended* Brief description [Screengrab]. Silvia Calderoni lies on the floor in front of a television, next to a pen and a piece of paper. From: Gucci Fest/YouTube. <https://www.youtube.com/watch?v=zKqbG6TLYnc&t=528s>

# THE CRAFTSMAN AND DESIGN 4.0

## A RECONSIDERATION OF CREATIVE VALUE

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## Abstract

The paper has the intention to open a thinking space for the complexity of the scenarios in the current Italian manufacture: promoters of Italian excellence on one side and places for theoretical debate over the wide mutations we are living on the other.

The evolution of the industry 4.0 allows us to reconsider methodologies and resources to keep our heritage of beauty and practical knowledge alive and thriving. The study moves through a theoretical framework where we encounter the strong necessity for digital and technological evolution, as well as the stewardship for the figure of the artisan, a skillful identity who enriches the meaning of our projectuality through their mastery and handcraft.

The Made in Italy concept functions then as a catalyst for study and consideration, launching a discussion that is just complex as it is necessary.

**Keywords:** Transition Design, Design 4.0, Creative process, Made in Italy, Craftsman

## Transition Time

The historic era we are finding ourselves in presents remarkable and dynamic changes which allow to deepen the necessary and worthwhile research in order to comprehend the situation we are currently called to investigate.

The evolution of the 4.0 industry brought especially significant mutations in the fashion industry, for it may be the field which better understands the urgency for an evolutive process in Italian manufacturing and artisanal systems. Its nature allows it to orient, condition and tell about the values and the involved territories to an international audience. The concept of circularity, sustainability and digitalization introduces a crucial shift to the Italian manufacturing practices.

Terry Irwin identifies the concept of Transition Design, an emerging research area which underlines the recognition of being amidst a time of transition (Irwin, 2015); in this framework, he places the natural condition to rethink more sustainable futures and elects design as the means par excellence to pursue this aim.

Detecting Transition design and Design 4.0 becomes therefore fundamental, for it entails

the necessity to reconsider the methodologies and tools which were previously applied, along investigating new trajectories to be found. Within this dimension, the concept of Made in Italy itself can find an evolutive rebirth, as the relationship between manufacture and handcraft, design and territories of production transform. Hence the need to reconsider the roles of their characters, lands and identity. Specifically, the figure of the artisan is capable of regenerating itself and contributing to the creation of value, where experimentation is fueled by research and technological specialization. Identifying design as the central element, understood as a process of connection and reconfiguration of resources (Vacca, 2013), it generates a complex supply chain characterized by the coexistence of artisanal and industrial processes, which are hybrid and multifaceted.

## Designed in Italy

The artisanal component has always been inherent to our territory, both in terms of realization and in regards to the conception and implementation of design practices closely linked to Italian design

(Rossi, 2015). In this dimension, knowledge related to tradition and craftsmanship actively contributes to the enrichment of our cultural heritage, preserving them while simultaneously allowing for a reevaluation of the design process, giving it new boundaries and forms. The powerful dichotomy of tradition and innovation finds space for a significant reinterpretation today, where the vast production capacity allows for great experimental leaps, leading to the reconfiguration of the value chain itself. The work conducted by Paola Bertola and Federica Vacca in the book “Eccellenza italiana: artefatti ad alto contenuto culturale” is particularly interesting, as the authors identify the main variables in which the strong relationship between design and craftsmanship in Italy emerges (Bertola & Vacca, 2020).

The reflection finds its starting point in the ability to articulate a design language that is capable, on one hand, of preserving artisanal knowledge by emphasizing specialization and engaging with material culture and territorial tradition. On the other, it is activated through reinterpretations of traditional practices and techniques that acquire new meanings. Hence, there is a need to enhance the content by harnessing and utilizing new technologies which are capable of conveying different meanings and adapting to the changes that design is called upon to address nowadays. The aim to reconfigure the value chain takes shape in the debate between the traditional dimension and an approach focused on process redesign and new design forms. While historically the distinction between industrial and traditional products was linked to the quantity brought to the market, the current scenario supports the concept of small-scale ultra-luxury production. This dimension highlights exceptionalism, uniqueness and dynamism through customization and the definition of a private and intimate sphere of consumption (Branzi, 2009; Colombi, 2009).

These considerations allow us to interpret the Italian context, understanding the complexity of the relationship between design and craftsmanship, without neglecting the process of cultural innovation with which these practices continue to enrich our heritage. Their presence ensures the perpetuation of the concept of excellence as a cultural quality that manifests through techniques and innovations, influencing and guaranteeing a distinctive sense of identity and differentiation.

## **From Artisan to Design 4.0**

The combination of artisanal craftsmanship and new technologies generates a process that integrates designers, artisans, producers, and consumers more effectively. The potential of this strong and rooted relationship constantly produces innovative solutions. In fact, “Design [...] is about saying and doing, it is industry and craftsmanship, it is art and functionality, it is process and method; above all, it is the driving force behind continuous, not merely specific, innovation that aspires to intervene in the entire process from the conception of things to their role in our life systems” (Follesa, 2013, p.19). This statement emphasizes the intention not to nostalgically chase artisanal trades of the past but, on the contrary, to valorize the profile and characteristics of the artisan: the passion for quality work, the constant commitment to improving and deepening techniques, and the rootedness in socially recognized communities around practice (Micelli, 2011).

The current challenge lies in finding the best way to promote the encounter between creativity and artisanal work. The approach of Design 4.0 serves as the ideal guarantor to create the conditions for this meeting point, utilizing the digital revolution and its tools, while responding to social needs, design techniques, and globalization. The goal is to enhance the territory and its craftsmanship. The potential of this process is remarkable, considering themes related to traceability, such as using blockchain technology to demonstrate and guarantee originality and to reconstruct all phases of the production process, including origin and materials that are used.

The use of virtual reality as a tool to engage the user in order to refine processes within the production cycle is also noteworthy. Realistic simulations are employed to manage data capable of conducting future maintenance and providing valuable feedback to the designing process (Beltrametti et al., 2017).

Supporting this, the experience conducted by FCA - Fiat Chrysler Automobiles is particularly worthy of note. They have developed specific studies and research to bring forward new approaches with the purpose of analyzing the ergonomics of workstations. The use of technological tools has made it possible to define a three-dimensional virtual environment, verifying and identifying configurations capable of adapting to the operator and the product, thus generating more flexible

production processes (Caputo & Lardante, 2016). The interesting aspects that emerged include operator visibility, reachability, tool usability, comfort, and even individualization of potential workplace hazards.

In this context, the functional transformation of processes, which can be enhanced by improving the production evolution implemented by technology, becomes evident. It offers products on the market with new experiential functionalities. Therefore, we can affirm that Design 4.0 plays a central role in this transformative phase where the object of design shifts from the artifact to the process itself, blending technical and humanistic knowledge to ensure the creation of products and services that continue to meet human needs. The emerging model opens up new paths of high design value to explore and experiment with. Speaking of Design 4.0, it is not merely limited to technological conversion but rather to the definition of an organized model in which digitization and interaction coexist with the contribution of specialized and qualified workers who can navigate within dynamic and flexible processes characteristic of artisanal craftsmanship.

### **New Possible Scenarios**

The redefinition of this process brings innovative momentum and extremely interesting dynamics illustrated in the contribution “Virtual Production Districts: The Transition of Made in Italy in Fashion” by Giovanni Maria Conti and Paolo Franzo (Conti & Franzo, 2020). The examined and proposed case studies outline a possible direction in support of what has been said so far. Specifically, these are realities that aim to reconnect artisanal work with innovative systems thanks to the adoption of digital language and tools. The first example is Italian Artisan, a platform created by Davide Clementoni in 2015, which brings together over 300 Italian artisans and more than 1700 international designers, providing a system centered around the design and production of clothing, shoes, bags, and accessories. This platform is significantly interesting as it generates a functional interaction system that redefines the relationship between designers and artisans, allowing them to collaborate and intertwine creativity, skills, and craftsmanship. The project provides technological and human support to facilitate the relational connection between Italian artisans and designers. Interconnection and

networking appear therefore crucial, especially in a complex structure of diversified territories like Italy, where they can overcome geographic limitations and offer an alternative.

The contribution also highlights Up To You Anthology, founded by Nicolò Gavazzi in 2019. One innovative aspect of this other platform is the ability to access the “Design your bag” section. In this area, users can propose their own bag ideas by providing all the necessary elements for its realization. The team evaluates the project’s suitability and introduces the user to a consultant who will accompany the product’s development and production, involving various artisans. Subsequently, still-life photos of the prototype are made for the placement inside the e-commerce platform, allowing pre-order sales. These creative projects find their space once again in the creation of a new design approach, making the production system of Made in Italy more accessible. Traditional production processes are evolving by utilizing artisanal and specialized craftsmanship whilst embracing the opportunities offered by digital technologies.

Lastly, Hands on Design, created in Milan in 2015, is a platform for jewelry and other design objects, connecting international designers with artisans, with products available for purchase in a dedicated e-commerce section. The project unfolds through concept interpretations by designers, which are then presented to artisans who, based on their skills and specialties, select the ones then to be created. The system that emerges defines a synergistic collaboration between designers and artisans, mediated by the coherence criteria adopted by the platform. An essential characteristic of this system is the equality of visibility for all participants in the design process. The website’s structure encourages this equality by presenting images and descriptions of designers and artisans side by side, giving them equal value. These examples demonstrate new configurations of the protagonists who animate Design 4.0, maintaining a central role in redefining otherwise seemingly consolidated systems.

### **Marzotto: Digital Advantages**

The textile industry is proving to be particularly open to change and increased use of digital technologies to incorporate them into their production processes, identifying the significant advantages that these tools can provide to the

innovation of the entire process. The positive momentum towards these new approaches ranges from the development of fabric prototypes to the actual production phase. This enthusiasm needs to be examined within a series of considerations that the company must take into account in order to meet and satisfy the needs and desires of customers, without eliminating or losing the skills and specificities that distinguish it.

Marzotto Group, specifically, has understood the potential of digitalization from the outset, evolving the working process by trying to reduce the use of physical and real fabric samples towards a digital version. This operation is intended to arrange an immediate image of the fabric, anticipating the actual production phase. The considerations that arise rotate around the difficulties in guaranteeing a realistic fitting starting from two-dimensional CAD designs, which must reflect the physical characteristics of three-dimensional fabrics. The second critical aspect relates to the need to use an interface that is suitable and compatible with the various CAD softwares used by Marzotto's clients, in addition to the training process of the users themselves. Despite these aspects, the digitalization process conducted by the group has reconsidered various stages of prototyping, distinctively: measuring colors, materials, and fabrics; distributing data through interfaces and monitors; sophisticated reworking of two-dimensional and three-dimensional models of the projects. The ultimate goal is the digital connection of all these various processes. In this regard, Luca Bieco, IT specialist at Marzotto Group, states: "One of the critical factors to

evaluate and monitor is the sharing of know-how and inter-functional collaboration with our business partners in order to ensure a multidirectional workflow," he continues, "We have long sought a solution that meets our precision and color accuracy requirements. With the renowned EIZO graphic processing models, we have found what works for us" (EIZO, 2023). The use of these highly technological devices has allowed precise and efficient color calibration, guaranteeing exceptionally realistic samples and unerring reproduction of physical models.

The provided example clarifies one of the many facets that can be explored and developed by brands and companies using technological tools. It furthers the possibility of specialization for various artisans working within the system, providing new stimuli and innovatively expanding skills and expertise,

generating and training employees capable of operating in increasingly advanced and design-flexible systems.

## Conclusions

The revolution of Design 4.0 proposes a reflection upon a new organization of the creative process, one that is capable of opening innovative and valuable perspectives. The intention of this brief overview emphasizes the importance of the role of the artisan, which maintains a central position even in the era of Design 4.0, linked to the transformation and digitalization process of Made in Italy and Italian manufacturing.

Design 4.0 appears to be a connector capable of keeping the centrality of the artisanal presence alive in contemporary design processes, carrying knowledge and practices developed and improved within the workshops and ateliers, made then available to designers and the industry (Andamson, 2007). The emerging model carries a significant amount of value, shifting the focus from the artifact to the process itself, not only by digitally converting the system but also by creating a new balance between the specialized operator and increasingly dynamic and flexible processes.

This powerful synergy is able to respond to social needs, techniques, and the globalization of design, celebrating the territory and its craftsmanship. The cultural and treasurable heritage that belongs to us should not only be made known and preserved, but also be meant to provide an opportunity to rethink the relationship between creativity and production, fashion and the territory, tradition and innovation. When hand and machine, artisanal awareness, and technological innovation come together, the conditions for the revival of the creative and productive process, which is so characteristic to our design identity, grow.

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# OTHER SYSTEM

## BETWEEN WASTE AND APPROPRIATION

### AN ANALYSIS OF A DIFFERENT SCENARIO FOR THE FASHION SYSTEM

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## Abstract

Fashion industry is one of the sectors that has the highest environmental impact, furthermore, because of its supply chain, the increase of textile and clothing waste production has become a huge global concern. The fashion system must play an important role in the path towards sustainability giving the waste a bigger value than the one it has today. Luckily, new ways of production are spreading out, giving life to the “Other system”: a different, circular path that encourages an innovative eye on fashion wastes.

Waste has been commonly considered as an unwanted or unusable material. Following the attempt to highlight the value of waste, this study investigates three research questions:

Are there any different ways of fashion production?

What are the links between them?

What are the differences between the “Other system” and the traditional fashion system?

For this research seventeen case studies have been considered, including textile producers and vendors, fashion brands and textile artists.

**Keywords:** Waste, Sustainability, Fashion System, Pre-Consumption, Post-Production

## Introduction

Nowadays the fashion market demand seems to be on continual growth, even though the fashion industry is a sector with a high environmental impact. As a matter of fact, the current consumer society imposes that everything old needs to be thrown away, consequently, these mechanisms of rejection create the distinctions between the productive and unproductive, the included and excluded, causing a new reality made of waste (Bourriaud, 2016). What Bourriaud calls “the exform” is a sign or form seized by exclusionary stakes, cultural, social, or political: the exform appears as a moving territory in which the exform exists and it is suffused by centrifugal forces, the unwanted and the official, mechanisms of rejection and rehabilitation. This duality Bourriaud talks about can be identified in some new territories of exploration in the fashion world, especially in newborn fashion brands and industries. The fusion of power and toxicity that the fashion industry must face nowadays can find his origins in the organosphere, the ecologies of humans and their entanglements with the environment. Wasteocene is the term Marco Armiero uses to identify

the contemporary society, characterized by the imposition of wasting relationships on subaltern human and more-than-human communities that implies the construction of toxic ecologies made of contaminating substances and narratives (Armiero, 2021).

An analysis conducted by the author aims to identify the waste of the fashion system, dividing it in pre-consumption and post-consumption: while the first one is linked to the fashion industry; the latter is connected to the fashion consume. With regards to the pre-consumption, there are two main division into primary and secondary waste. The primary waste of a textile manufacturing are production residues, sewing wastes, ends sides of bobbins, discarded fabrics, cloths and fabrics, fibres and yarns, damaged fabrics, chemical wastes; while the secondary ones are distaff, cones, pallets, containers and drums, dyes and chemicals, plastic wrap, cardboards, paper, and intangible resources of energy. Furthermore, for clothing companies, the primary waste category includes fabrics and scraps, sewing threads, trimmings, patterns, and fragments, while secondary waste includes cones, pallets, shipping packaging, wrapping paper, sacks, bags, and plastic wraps (Tartaglione & Corradini, 2013).

Even though multiple studies are trying to optimize re-use techniques, the complex production model of the fashion industry is still generating tons of wastes that could be used again in the production cycle. All things considered, reusing fashion pre-consumption wastes could be considered as a “stage transition”, as also claimed by the cradle-to-cradle method (Braungart & McDonough, 2002). The C2C theory implies a waste free create system and investigates a regenerative design. As a result, everything that is born can be born again, remaining in its cradle, therefore the materials used by the supply chains are reinserted in the subsequent production cycles. Currently, the Italian fashion and textile sector offers three main trends to the use of waste: to extend the end-of-life of textile products, to reuse the textile product as a secondary raw material for other production cycles, to address the waste in material and energy recovery processes. Secondary raw materials, also called MPS, consist of waste material from the processing of raw materials or materials derived from waste recovery and recycling. Properly processed, it is possible to obtain a material that is practically the same as the one to be extracted, while respecting the environment and avoiding the withdraw of now-limited raw materials. However, there are still few initiatives aimed at revaluing pre-consumer wastes. In fact, considering the amount of material, there seems to be a gap between supply and demand: brands tend to prefer the new, addressing to companies that produce under demand. Choosing the perfect fabric, the exact colour and pattern, still turns out to be the most efficient way to make a collection, giving the possibility to have unlimited length, reduced time set aside for research, and it makes the risk of unforeseen problems smaller. This may seem the best choice, on the other hand it is feeding a system that has been showing its flaws in recent years. In fact, the dominant production system in recent decades has been characterized by a “linear” type of economic model, causing mass-producing fashion products, stimulating enormous waste production, including the waste of raw materials and energy. It is estimated that most Italian companies have an overproduction of 20 percent.

While some types of post-industrial waste can be recovered through upcycling projects, others remain as new untouched materials. There could be several reasons of their disuse, such as a flawed tint, a misprinting or just the production of too many fabrics and textiles compared to the demand. The real problem seems to lie in the system itself, if the

surplus materials are not used at the time they are produced, no industry will ever buy and use them. Specifically, fashion has an inner contradiction: each fashion is sold as eternal, on the contrary it will easily be replaced by the next one. Fashion’s only constant is its inherent change (Simmel, 1996). The succession of collections generates unused or unsold material, as a result this is stored until the stock costs became so high that the only solution is getting rid of it, also if it is unused.

## Case Studies

The focus of this study is on pre-consumer and post-industrial wastes and the central point is to investigate the change of the production ways adopted by some fashion industries and brands to exploit and reduce the over production. All the case studies considered are creating a new path towards sustainability that in this paper is called “Other system”. Twenty case studies have been analysed and interviewed, including textile producers and vendors, fashion brands and textile artists. Some case studies have been chosen for the following main reasons:

- Innovative production ways to reduce and optimize wastes
- Responsible materials selection
- Introduction of new policies for the clients
- Transparency

Nevertheless, to make a clear comparison about the differences between some companies’ structures and others and to analyse the critics of the nowadays fashion system, some case studies follow a more traditional fashion industry scheme.

Except for the textile art field, the interviews for the case studies have been driven by seven questions:

- - Where do the fabrics and textiles used for your industry come from?
- - In your industry, what is waste?
- - What happens to the waste your industrial or manufacturing process produce?
- - What is the outcome of your production system?
- - Are there some unsold pieces? What happens to them?
- - Who is your final client?
- - How would you describe your clientele?

From these few questions it becomes easier to understand the structure of a company and its similarities and differences from the other types. Some deeper questions have been put for the case

studies that had a more innovative approach than the others:

- How does your clientele respond to your different approaches?
- Why would you say that your client is conscious and what do you think the characteristics of a conscious consumer are?
- What are the problems in adopting a production method that moves away from the traditional ones? How does this impact on the profits?

After the collection of all this information, the data have been divided per categories following the business name. The [fig. 01] illustrates the variety of the business considered in a diagram.

The first type of company analysed is fabric and textile deadstock. Two stockists accepted to answer the interview, and it has been sufficient to understand how their activity works. The aim of a fabric stock is to collect unsold and rejected fabrics from different manufacturing companies and resell them to other companies, small brands, or independent designers, following the theory of the lean consumption. These B2B companies sell out deadstock fabrics, recognising the potential that waste material has. In addition, it emerged that their type of customers is not only companies, but also shopkeepers who resell in their shops the

variety of fabrics they can find out of deadstock. Consequently, two shopkeepers have been interviewed. Both declared they only select and purchase top-quality deadstock fabrics from the unsold of large Italian companies, reselling it and giving a new chance to be used. Of course, also a fabric shop produces wastes, which corresponds to the unsold pieces. To get rid of them they donate scraps to art schools or as a gift to their clients.

The next target sample to be analysed consists of a group of Italian textile manufacturing companies. During all the production stages of the mills taken in analysis there are different types of wastes. Even though there are no effective plans to reduce or reuse their wastes, there is a strong desire for reactivating them through their donation to young designers, universities, and artists. However, one case study differs from the others: an Italian woolen mill in Follina, near Treviso, hosts artists and designers for short periods (from six months to a year) to let them work on their wastes with special projects. This type of support not only generates new connections between the industry and young creatives, but also it is useful to reactivate unused spaces and materials they have in their mill. Therefore, the following group of companies analysed is composed by big and small fashion

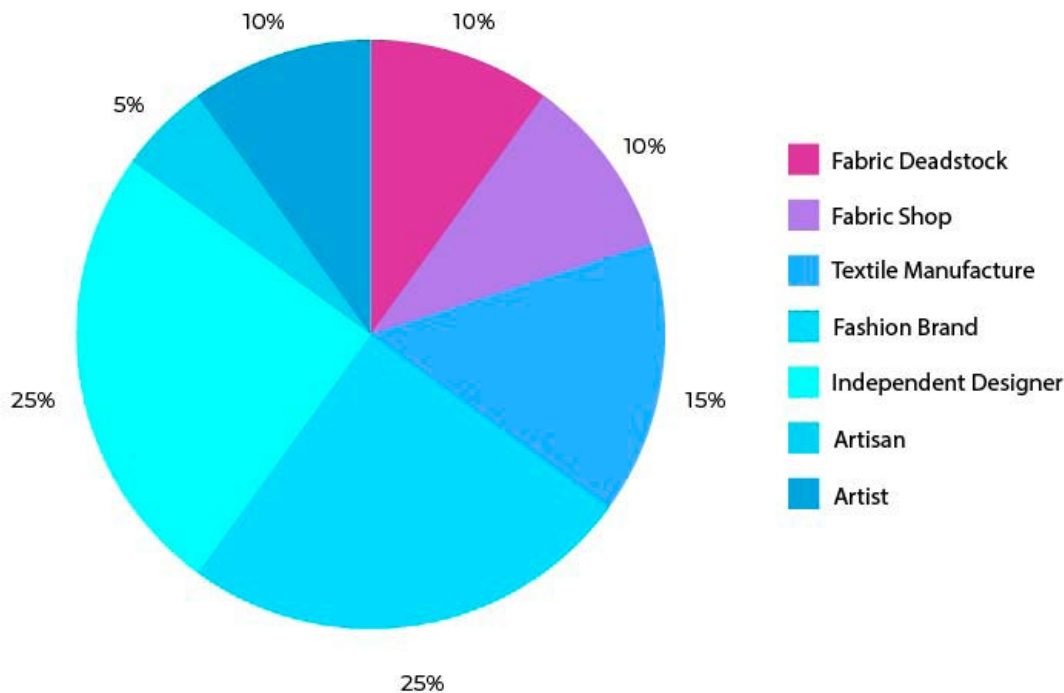


Fig. 01

brands, independent designers, shoes designers, accessories designers, and artisans. These case studies have been chosen mostly because of their proposals of an innovative approach that aims to avoid waste and to use deadstock materials. In particular, the two tendencies analysed are: the use of applications like labelling or to cover and style the hangers. Some brands differ from the others in terms of seasoning. New attempts to change the fashion seasoning has been identified, such as creating a unique collection that can last the whole year through evergreen fabrics and new technologies and designs. Finally, two artists have been interviewed to understand the differences between the use of waste in the fashion and in the art worlds, offering new alternative scenarios to work with.

## Results

The final aim of this research is to investigate if there are new business realities that could create an alternative fashion system. The “Other system” is a symbiosis of more actors from the fashion world that cooperate to reach not only a more sustainable production but also a more inclusive and responsible fashion system. The case studies analysed are some actual companies that are exploring better methods to face the needs of nowadays society.

Each case study differs from the other in terms of prominence, business name and clientele. Nevertheless, some trends emerged from the data collected and are useful to define the “Other system”. To identify and promote these movements, six categories have been created and named as follows:

- Between limits and creative opportunities
- Other time and post-production
- Research and waiting times
- The exception of accessories
- Beyond fashion

“Between limitation and creative opportunity” highlights the obstacles which could be encountered when working with wasted materials. The limitation is the main obstacle, and it involves both inventive and practical requires. On the one hand, a creative limitation has been found in some case studies, on the other hand the practical issue of reproducibility can hold back the profits. However, some designers can exploit the limitations as an incentive to their creativity and see in the lack

of reproducibility the opportunity to make their pieces unique. In addition, in some case studies the problem of lack of materials made the designers explore and exploit some techniques such as the patchwork or embroidery to guarantee the same fabric and aspect on a larger scale of production. The relationship between the “Other system” and the time needs to be analysed. In fact, fashion seasons conflicts with the market of waste. Even if fashion market needs to change periodically, the power of the market of waste is to cross the temporalities, so what chronologically belongs to the past can be re-actualised in the present, becoming the current fashion (King, 2000). In addition, nowadays media impacts the time in fashion: real-time communication plays an important role regards the evolution of tendencies and the perception of new trends. The speed of the images flow, which is available daily through personal technologies, exasperates the perception of a programmed obsolescence and erases the distances between past, present, and future (Casu et al., 2018). The case studies have revealed different interpretations of time: the adaptability to every season, the evergreen product in terms of beauty and elegance and finally the collision between a material from past collections and a new item. As a result, the “other time” could be a term used to depicture the temporality that emerged during this study. Specifically, the products analysed are made from dead materials from past collections, taken up and made current. Their temporality is suspended in a fluid collection where there is no longer any distinction between past, present, and future. For example, some brands’ strategies encourage a permanent collection, leaving the seasonality of fashion, they adopt a periodic addition of garments and accessories that creates a unique collection which does not belong to a single season nor year. This concept of time assumes the characteristics of the post-production art (Bourriaud, 2016), which confuses the temporal universes with current and simultaneous references between past and present. “Research and waiting times” is the result of an analysis of both the company strategies for the supply of materials and the client attitude. For the companies, it is important to underline how much the choice of fabric and materials can be influenced by the time. In fact, it tends to be quicker for both the buyer and the seller to have a catalogue of fabrics ready each season with the guarantee of unlimited availability, colour variants and different fabric weights. According to the data collected,

the decision to buy deadstock fabrics requires a longer research time and many risks such as limited availability, possible damaged or faded materials, limited colour choices. However, there are solutions identified by some case studies to make the research faster, for example choosing simple colour palettes and materials. Waiting times, on the other hand, are linked to the customer attitude. In fact, in some of the “other system” companies’ strategies there is the pre-order and the after-sales service. Thanks to the pre-order strategy, the fashion brands know how many items they must produce based on the buyers’ pre-orders, avoiding over production. While the after-sales service is a way to teach the consumer how to care for personal products and try to extend the life of a product as much as possible.

In contrast to the themes discussed so far, the world of shoes and accessories runs in a different way. In fact, the problem of reproduction identified before seems not to be so hard because of the few materials used for each piece. Even though the shoes and accessories brand analysed have different sizes of production and their products are positioned in different types of markets, the results of the interviews are mostly in line.

Finally, the universe of fashion waste used in the art world has been analysed. The relationship between art and waste is very complex: art denies the existence of waste as itself since nothing and no-one can be considered as non-interpretable. The artworks circulate in a hybrid universe between product and waste, on the one hand using leftovers, on the other giving it a value (Bourriaud, 2016).

## Conclusions

The first aim of this work has been to analyse and define the fashion post-production waste. Research and interviews were carried out to make clear how the fashion system works and what type of changes could drive us to new future possibilities. Subsequently, it has been necessary to understand if the pre-consumption waste could still be used in the fashion industry and how could this be possible. This research has re-evaluated textile waste showing its possibilities and eliminating the negative meaning linked to the name it brings. Fashion wastes can be reinserted into the fashion market or become part of artistic projects. Unused materials can be reintroduced into a new life cycle without the need to fear the passing of seasons and trends. The “Other system” highlights some new strategies

that could help to face the actual environmental crisis encouraging an innovative eye on the fashion system. There appears to be a good possibility that the “Other system” could open to a new perspective on the production and consumption of fashion, reaching what the philosopher Leonardo Caffo, in his book *Velocità di fuga*, calls “stability”. The idea of stability requires a social movement that clashes with the traditional idea of progress, that is aware of the contemporary problems. Instead of rushing towards the progress, Caffo invites everyone to stop and rethink the present looking at the future with a conscious idea of stability (Caffo, 2022).

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## Figure Captions:

Fig. 01: From the author, Business name analysed, 2022.

# FASHION LIBRARIES

## BETWEEN MATERIAL AND IMMATERIAL SHELVES

ILARIA TRAME

International Library of Fashion Research

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## Abstract

This article represents a reflection extracted and reworked from my MA thesis titled *Beyond the Library: A Study of Fashion Documents' Archival Spaces*. With a reflection on the current panorama on the field fashion libraries, this paper aims to unpack the relationship that are at stake between social media archives and fashion libraries at large. Often seen as an unmatchable duality, with the opposition between paper and the digital that seems to be in constant contrast, I aim to demonstrate that the two fields can not only coexist, but also be of mutual benefit for the formation of a more actualised, inclusive and comprehensive definition of 'fashion library'.

**Keywords:** Fashion Library, Digital Fashion Library, Fashion Research, Archive, Fashion Collections

## Introduction

In the last years the digital turn and social media platforms have challenged a reimagination of what a library can be. In this realm, in fact, everything becomes potentially a library. In 2023, we see an emerging fashionability around the institution of the library, especially in the field of fashion, through the means of digital platforms. On Instagram in particular, we witness an emergence of several profiles using and abusing of the terminology that belongs to what was usually identified as fashion's paper temples. To mention a few, @milanofashionlibrary, @garment\_library, @queer\_reads\_library, @fashionbusinesslibrary, @veganfashionlibrary, or even @archived.dreams, @archivepdf, @archived and @a\_r\_c\_h\_i\_v\_i\_s\_t. These are only a few of the most popular profiles that, by appropriating of the terminology of 'library' or 'archive', seem to be addressing a large portion of the Instagram mainstream public, although the topic of the 'fashion document' does not seem to have the same appeal and interest for fashion insiders (and non) outside the social media realm. The use of terms like 'library' and 'archive' seems to,

in a way, legitimise some hypothetical knowledge that the profile seems to have over a portion of the fashion industry and to gain a certain institutional recognition from the platform, therefore gathering the attention of the public. What is compelling about these examples is, in fact, the use of a certain terminology that belongs to a fetishist way of looking at the document — like the words 'archived', 'grotesque', 'private' or 'hidden', applied for example when identifying simply vintage clothing shops such as @thegrotesquearchive, @hidden.ny, @thearchiviststore — and that somehow increases the aura behind these profile, as if the definition of 'archive' itself refers to something unreachable and to be deemed as a true cult. Why do these names sound so appealing to the public when almost no interest has been shown by fashion insiders, fashion institutions, fashion exhibitions, to what an archive or a library usually preserves? Why are fashion documents so overlooked by the fashion system itself and yet their secretive appeal seems to increase the value and popularity they can gain in digital platforms? Another proof of the proliferation of the popularity of the library as an institution — and therefore of the push towards the expansion of the concept of

the library and its practices after the digital turn — can be found in an emerging resurgence of the due to the loss of their materiality in the ever-evolving digital platforms. It is very common now to find on Instagram the profile of, for example, many museum or school libraries, in which they display new acquisitions or relevant documents from the collection. Some of the most notable are @costumeinstitutelibrary, @momulibrary, @bibliotecaiuav, @fitlibrary, all curated by their librarians. What these institutions have in common is that they represent places that tend to be quite exclusive in the way they are conceived.

Museums libraries and university libraries, similarly to archives and documentation centres, do not often seem easily accessible to most researchers, as people might have to be students, book appointments or give reasons for their visit to what is a portion of a bigger institution. The Instagram profile, however, can represent a shortcut for this. As materials and extracts of books are shared on social media, an interested researcher might not even have the necessity to leave the house to find what is looking for, thus pushing towards a more curated, and even superficial, type of research (as the only pages accessible are the ones that are pre-selected by the librarian). It is, however, a more inclusive way of looking at the collection of a library, which might represent a risk for this institution to be rethought through the digital realm. The online in fact, has become a democratic tool to approach a limited number of objects that can be rare, hard-to-find, or even private. Therefore, there seems to be a necessity to rethink the discourse regarding the nature of these places and the access to these types of documentation too.

An emblematic example of this tricky relationship between digital and physical library can be found in the case of the International Library of Fashion Research, that was founded in Oslo in 2020 by editor and publisher Elise By Olsen. This institution, now hosted in the rooms of the National Museum of Art, Architecture and Design of Oslo, is open to researchers as a drop-in, free-access type of public library. It first gained the attention of fashion insiders by appearing as an Instagram profile and website in what seemed to be merely a 'digital library' (By Olsen, 2021). Now that the institution is running however, the webpage of the library still serves to its original purpose, being the database through which researchers can browse and discover what they could possibly find when accessing the shelves of the physical library. This,

I argue, demonstrates a possibility and elongation of how the two archives — the digital and the physical — can overlap and implement one another. It shows a possibility of the library to become a more actualized space. In addition, the website of the International Library of Fashion Research also serves as a space for micro-curation initiatives that can display a way of conducting research through the shelves of the library [Fig. 1]. In the page, in fact, while the materials can be searched by a simple search engine, they are also grouped and reimagined into curated sections, like for example by preference of the donor of the objects, or by thematic groups aimed to mimic a sort of exhibition display that the objects can partake into. Thus, these curatorial initiatives show another possibility of expansion that the digital realm can push. If in a physical archive objects and documents are carefully stored in proper boxes, acid-free cases and put in order in the fixed, stable shelf, in the digital archive this stability is often rethought, giving the possibility to the researcher to virtually witness the multiple ways in which one object can relate to the other and so on.

Therefore, this example showcases both a necessity and an opportunity to reposition and rethink the nature of the library in contemporary times and to reconsider the essence of the fashion knowledge it produces. While questioning the relevance of the institution of the library nowadays, my aim in this paper is to showcase how these institutions are still a necessity in the fashion industry and are not outdated or destined to be replaced by the apparent more dynamic reality of the digital realm. More specifically I aim to demonstrate how the two worlds tend to favour and exchange with one another, making the former fundamental to the latter and vice versa. I argue in fact that understanding the current stake and identity of a fashion library means also to understand multiple methods of conducting fashion research nowadays.

## Unpacking the Terminology

In order to re-define the institution of the fashion library in current times, previous studies and definitions of these types of spaces need to be taken into account.

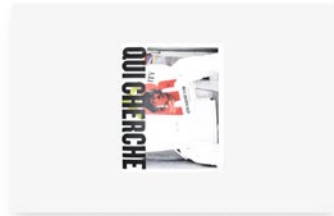
In 1967, the French philosopher Michel Foucault outlined one of the most comprehensive descriptions of the space of the library, defining it with his concept of heterotopia. A heterotopia





Our selection for the exhibition "Printed Dialogues" in collaboration with Parsons Paris Library in May 2023. The selection focuses on five axes: bodies; actors; geographies; eventful shifts; and material matters.

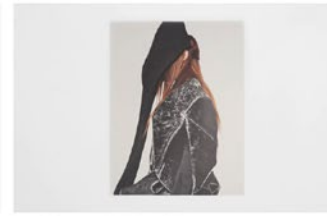
### Printed Dialogues



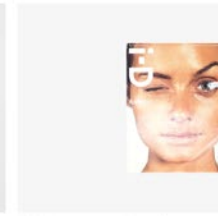
Parsons Paris "Qui Cherche Trouve?" Pamphlet 2023



Helmut Lang Autumn 1999-2000 1999



Rick Owens FW 17 Glitter 2017



iD Magazine March 1999 1999

A selection to showcase Louise Bourgeois constant influence, dialogue and exchange with fashion  
**Louise Bourgeois: Imaginary Conversations**



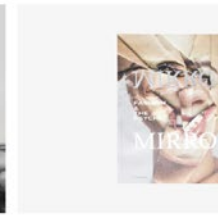
W Magazine September 2010 2010



A magazine curated by Simone Rocha 2018



Memoire de la Mode Comme des Garçons 1998



Mirror Mirror: Fashion and 2022

Fig. 01

is a real and concrete site, linguistically and conceptually opposed to the utopian one. These spaces have rules, expectations and power relations that define them and that need to be followed. He uses the library as a good example to understand the concept, since this place can be defined as a type of heterotopia that is linked to "slices in time" (Foucault, 1972; Miskowiec, 1986). The library in fact, just like the museum, breaks the relationship between men and the time they live in, and it constitutes a heterotopia that functions with the purpose of accumulating time:

"The idea of accumulating everything, of establishing a sort of general archive, the will to enclose in one place all times, all epochs, all forms, all tastes, the idea of constituting a place of all times that is itself outside of time and inaccessible to its ravages, the project of organising in this way a sort of perpetual and indefinite accumulation of time in an immobile place, this whole idea belongs to our modernity. The museum and the library are heterotopia that are proper to western culture of the nineteenth century." (Foucault, 1972; Miskowiec 1986).

The library is therefore the product of contemporary times, seen as a place that is thought to encapsulate other testimonies of multiple epochs and different spaces in a unique site. The relevance of the library lays in its physicality, at least

metaphorically. It is seen as a finite site whose space inside is bigger than the one of its own physical building or room. If we consider this definition in contemporary times, multiple types of libraries, that can be defined as heterotopia are emerging. Can the physicality of the library that Foucault is referring to be identified as a digital one too? I argue that, in order to be relevant in the realm of the twenty-first century, the physicality of the library needs in fact to include also certain digital platforms, as they can encapsulate different epochs and spaces in one whole, comprehensive space that accumulates knowledge while transcending the rules of time and space. By the means of an Instagram page, online archives like the one of @rarebooksparis, an online bookstore specialized in rare, one-offs contemporary fashion publications, becomes a heterotopia in the sense that its followers can easily jump from one fashion remarkable moment to the other by simply scrolling down the page [Fig. 2]. At the same moment, the act of stopping, recollecting, screenshotting certain images can let a person get in touch with a form of knowledge that would instead be distant and secluded from the mainstream public if the owner of the page did not decide to put it at service of researchers, for free, by also providing important information in the caption on who the practitioners related to that peculiar image are.

Thus, by applying the definition given by Foucault to the current stake of fashion libraries, I have arrived to consider that the margins and the physicality of the term 'library' need to be enlarged to become a more comprehensive device that gathers these variety of identities. In addition, there needs to be a further recognition of the materials that are normally preserved within its (virtual or physical) walls. By acknowledging these differences, we notice that oftentimes certain institutions that fall under the umbrella term 'library' may flirt with other type of institutions like archives and centres of documentation, a link that it is already much more evident in the digital realm since pages and profiles often mix and exchange the terminology that usually refers to one or the other institution without particular attention due.

The centre of documentation, for example, can overlap with the library since it represents a research centre usually placed inside a bigger institution, for example the one of a museum. As the term suggests, this type of collection is usually dealing with printed and flimsy documents that are supporting the objects that belong to the 'main collection' of the museum. The centre also acts to map the activities of the institution (exhibitions reviews and documentation, etc...). This definition, I argue, already implies a hierarchical differentiation of certain objects that should be identified as more important than others. If we take the example of the fashion museum in fact, the 'main collection' would be the one of clothes and garments preserved in the archive, while the printed matter created around the same fashion is deemed as being identified as 'supporting materials', thus not as worthy of the attention of the public. If, however, these collections are taken and translated to the digital realm, this difference seems to be less evident, as these flimsier, secluded and non-public materials, meaning fashion ephemera, seem to gather the attention and interest of many devoted followers. This is because usually only professionals in the related field can reserve an appointment to consult the documentation. In this sense, the centre of documentation seems to be less democratic than the institution of a library in terms of the possibility to access its materials.

However, to consider the documentation centre as an elongation of the institution of the library, means to include ephemera in the collection of 'books' stored in the shelves. By ephemera we identify all those objects, documents, invitations, press releases, catalogues, lookbooks and materials

that survive their original function, thus to inform an event happening in the fashion industry, and that are preserved as gatekeepers of that part of fashion history (Pecorari, 2021). By considering the overlapping of identity between library and documentation centre, these types of objects also force us to manifest the multiplicity of the fashion library in terms of both its practices and its definition. These documents are in fact oftentimes responsible for bringing to the shelves of the library the concept of 'unofficial knowledge' introduced by Raphael Samuels, in order to speak for an alternative type of history distant from the one that is written by those institutions that act as temples of authorisation of history and knowledge

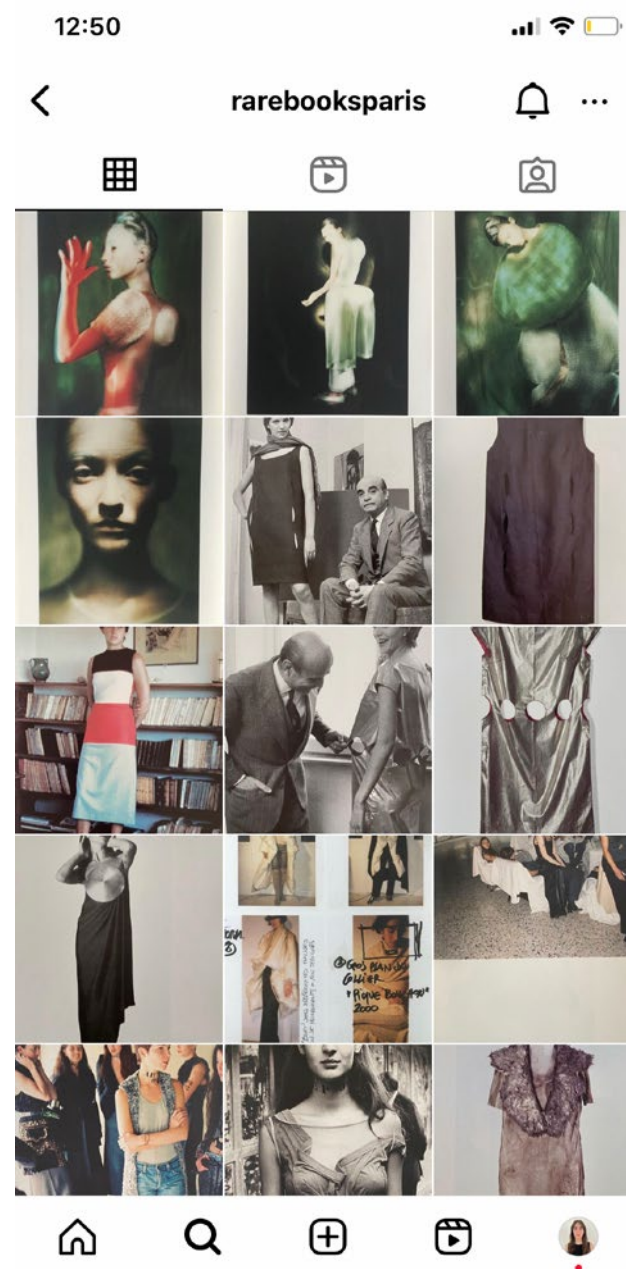


Fig. 02

— such as museums, but even ‘canonical’ libraries (Samuel, 1994). This type of knowledge encompasses the voices of the everyday too, by acknowledging memory as a form of history to be preserved, and then refers also to a personal story related to the artefacts (Samuel, 1994). In relation to ephemera, as they were previously belonging to a former practitioner of the industry who then decided to donate it to the institution, they often recall signs of its past owner and life: in an invitation to a fashion show for example, it is common to find the name of the person invited, and some eventual notes that the person might have taken at the event (Pecorari, 2021). In this sense, the interest from the general public towards these more ‘hidden’ dynamics behind the fashion system and the emerging fashionability of the ‘fashion document’ in Instagram platforms and social media pages can be further understood.

In a parallel and similar way, it can be also argued that the institution of the fashion library at times flirts with the idea of the archive as it may overlap with its original mission and function of conserving printed matter and objects that are non-accessible for people outside the fashion industry. In *The Archaeology of Knowledge* Michel Foucault defines the archives as “systems of statements” (Foucault, 1972) as he writes:

“The archive is first the law of what can be said, the system that governs the appearance of statements as unique events. But the archive is also that which determines that all these things said do not accumulate endlessly in an amorphous mass, nor are they inscribed in an unbroken linearity, nor do they disappear at the mercy of chance external accidents; but they are grouped together in distinct figures, composed together in accordance with multiple relations, maintained or blurred in accordance with specific regularities.” (Foucault, 1972).

In this view, the archive is what legitimates a thing or an event by organising these statements in multiple groups that present similar characteristics between each other and thus institutionalise knowledge. Furthermore, these statements — the materials contained in the archive — are not just documents, but take the large definition of ‘objects’. If considering that in the fashion system a library can encompass books, documents and, because of this overlapping, even objects, the institution of the fashion library acts just as the archive in authenticating and institutionalising facts and events. In this sense, every self-defined ‘library’

in the digital realm is then responsible for a form knowledge creation and institutionalisation of its own. Not only the library opens to a wider public, but also a wider public opens up further possibilities of understanding a fashion library. Hence, if we go back to the Instagram profiles that act as ‘digital libraries’, we could say that they are symptomatic examples that bring us to the necessity of rethinking the definition of ‘fashion library’ today. I argue in fact that with the advent of the digital, we observe a blurring of control and power in the ways libraries are constructed. Digital platforms have helped opening the dialogues about who is supposed to share and who is supposed to access certain aspects of the fashion system, also allowing a personal vision to enter the discussion. The digital realm also serves as a tool to decentralize the focus and interest of fashion. In doing so, the digital seems to be expanding an idea of the library, questioning its own mechanisms of control and ways of operating.

Therefore, I argued that due to the advent of the digital turn and to a growing fashionability of the terminology of the fashion library, the definition of ‘library’ itself needs to move beyond the one of merely a repository of books, and in doing so, it will broaden its scope. In fact, the library can be seen as a device to reorient an understanding of fashion beyond the garment alone, and will act to redefine several hierarchies of materials that are currently at stake in the fashion system. These additional objects of interests are fundamental to be studied today because they can speak for another, additional and parallel history of fashion, oftentimes complementary to the one written by the study of garments, whilst at times in opposing contrast. In a fashion library in fact, we might find clothes, but the garment may not be the most eloquent source to research a certain aspect of fashion as other types of documentation may be more declarative, like a personal document, a sketch, a written description and even through forms of oral history. This permits a formation of subsequent hierarchies of knowledge.

By letting this long-lived institution open up to new possibilities that are reoriented by the digital realm, the fashion library will prove to be a fundamental institution where research can and needs happen in several ways. The digital presence of certain materials will in fact not represent a risk for the library to become ‘unfashionable’ but rather an asset that can be utilised to expand its walls beyond their own physicality. In this sense,

the institution of the library would serve as an inclusive space were fashion histories are presented are re-presented, in multiple and varied ways. To conclude, every library, digital or physical, personal or public, produces a form of knowledge that can be defined in close relation to the materials it keeps and preserves, and thus speaks for. Conversely, the documents and materials that are part of a library concur to the creation of different types of knowledge, that if 'unofficial' will become 'official', and therefore to vary a definition of the nature of the library that, with the means of its digital presence, opens to be a more accessible and inclusive form of institutionalised knowledge.

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## Figure Captions

Fig. 01: International Library of Fashion Research Website. Micro-curved sections from previous projects and initiatives in which the library took part on or organized. Courtesy of International Library of Fashion Research.

Fig. 2: RareBooksParis Instagram Profile. A screenshot from the Instagram account @rarebooksparis, showcasing how social media platform can serve as research pages for many fashion insiders, but also for the general public. Courtesy of RareBooksParis.

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# THE PHYGITAL EVOLUTION

## DIGITIZATION OF HISTORICAL FABRICS FROM PRATO

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## Abstract

This contribution examines the results of a research project on collaborations between the audiovisual industry and the textile and fashion sector in the city of Prato, experimenting with new relationships between the physical and digital dimensions.

The main purpose of the project was the production of content for the textile manufacturing industry using innovative media production technologies such as 3D, animation, etc., transmitted through 5G network infrastructure. Specifically, the project focused on significant archives of the Prato textile district through a process of digitizing fabrics using productive reverse engineering techniques. This allowed for obtaining a digital representation of existing fabrics, preserving and enhancing the traditional textile heritage in a digital format. The use of advanced techniques enabled the accurate capture of fabric characteristics and properties, facilitating the creation of 3D models and their manipulation through media production technologies.

**Keywords:** Phygital, Prato Textile District, Reverse Engineering, Textile Heritage, Digitization

## Introduction

The research project Prato Phygital<sup>1</sup> explores the development of a fabric digitization procedure and its subsequent application in dynamic models, culminating in their representation in interactive digital environments. The project, with the synergistic collaboration of designer groups with diverse expertise, aims to digitize ten fabrics, five of which are sourced from the historical archive of the Prato Textile Museum and the other five from Marini Industrie Spa company's archive. Prato Phygital delves into a territory that is still in an experimental phase and seeks to identify new methodologies for the enhancement and redesign of heritage within one of the most significant textile districts – Prato. The proposed

digital transformation also offers new horizons of application for fabrics in various contexts ranging from fashion to product design, art, and even gaming, including gamification approaches (Tufarelli et al., 2022).

### From Physical to Digital Fabric

The first phase of the research focused on a thorough study of the processes involved in the production of fabrics made through Jacquard and dobby looms. This phase analyzed all the stages encompassing the weaving process, starting with essential knowledge of textile fibers and yarns, fabric analysis (composition and manufacturing), interlacing, color effects, twists, warp and weft notes, drawing-in and drafting, weaving, and interpretation of technical specifications. This initial part was crucial for the subsequent digital reconstruction of the selected samples, simplifying the subsequent operations. The selection of fabrics took into account both the historical and cultural significance as well as the technical feasibility, with the Prato Textile Museum [Fig. 1] focusing on the former and Marini Industrie SpA considering

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<sup>1</sup> The project was initiated in 2022 at the University of Florence, under the scientific supervision of Prof.ssa. Elisabetta Cianfanelli. It was funded by the Ministry of Economic Development (MISE) as part of the financing program for 5G and audiovisual. The project, in which the author participates as a research fellow, involves a partnership between Fondazione Sistema Toscana, University of Florence, Municipality of Prato, Museo del Tessuto di Prato, Marini Industrie, PIN-Polo Universitario Città di Prato, Immerxive s.r.l., Indiana Production, and Wind Tre.



Fig. 01

their heritage by digitizing some archival fabrics no longer in production, along with aesthetic patterns that represented their distinctive brand. The second phase involved the digital transformation of the selected fabrics using NedGraphics, one of the leading CAD software for digital fabric design.

The third phase encompassed the development of multilevel maps using Materialize software. This program allowed for the overlaying of multiple images with different characteristics, resulting in a simulation of the digital fabric that closely resembled reality.

The final phase involved the representation of the fabrics in digital environments through the design of iconic products in the world of design, such as statues, chairs, and cars, as well as the creation of a fashion collection. In this concluding part of the project, a redesign process was initiated, revisiting the original patterns in terms of colors and dimensions.

### **The CAD Process**

The initial phase of fabric digitization involves carefully studying the technical specifications provided by project partners. For historical fabrics from museums, textile experts first sampled the selected fabrics and then created technical sheets containing all the necessary information for the designers to proceed with the digital transformation. The actual CAD software from the NedGraphics package, specifically Texcelle, was then used for the digitization process. Depending on the complexity of the selected sample, the reconstruction of the pattern unfolded in three main subsets, each considered separately.

The first subset includes complex patterns that required the use of other software, such as Adobe Illustrator, for the digital reproduction of the design. In this specific case, the procedure involved tracing the fabric pattern as closely as possible and then importing the resulting image into the CAD. The second subset encompasses fabrics with a lower level of complexity compared to the first subset. These fabrics required refinement operations rather than tracing for digitization. A JPEG photo of the actual fabric sample, acquired directly from the



company, was imported into Texcelle, and the CAD's toolbar was used to digitize it. It is important to note this distinction because, leveraging certain CAD features like color reduction, the software automatically converts the image into a drawing, simplifying and speeding up the process.

The third subset includes fabrics with a low complexity gradient, such as stripes or tartan, which did not require importing or tracing the pattern for digital conversion. In such cases, the fabric's design was recreated by manually writing the warp and weft sequence, represented as an alphanumeric string (nAnB...nZ), in the CAD. This sequence automatically generated the key fabric pattern schema.

In all three cases, it was necessary to resize the images to match the actual loom size and assign attributes such as density and thread count. This process enabled the generation of the complete cardboard file necessary to reproduce the selected fabric on a physical loom.

Once a result that closely resembles reality, with a high level of detail, is achieved, an appropriate warp and weft sequence (nIn2...nn) or alphanumeric

string<sup>2</sup> is created to define the number of warp and weft threads. This marks the completion of the digitization phase in Texcelle. The native file generated by the CAD is in the DES domain. This file is then read by the Product Creator software, initiating the next step. The DES file is transformed by the new CAD, translating the warp/weft sequence set in Texcelle into matrices of n by m. Each matrix corresponds to a color-divided area, and in each cell of the color chart, depending on the data specified by the technical specifications<sup>3</sup>, a weave structure will be inserted, resulting in a particular warp and weft effect. In the YarnBook library, yarns (in terms of color and physical characteristics) can be selected and assigned to fill the design. Once all the matrices are filled and the yarns are set, a simulation of the fabric can be previewed; if deemed suitable, it is exported as the DSIM output file, which can be opened with the TrueColor program.

<sup>2</sup> In Category 3, this, combined with image resizing, is the only step to be followed in order to complete all the operations on Texcelle.

<sup>3</sup> Technical specifications could not be drafted for all fabrics. In such cases, reverse engineering operations were carried out starting from an image of the sample fabric.



Fig. 02

With TrueColor, we can visualize the simulation in its highest quality; the 2D texture is enhanced with shadows, giving the image a three-dimensional effect. Using this program, a quality check was also performed to verify if the chosen shade corresponds to the real one. Once the texture base is validated by the partners, the CAD process concludes with the final export of a JPEG image at 4000 DPI.

A separate case, as it involves variations in the transformation methodologies, is the digitalization process of fabrics woven on a dobby loom. In this case, since the pattern is created solely by inserting the weave structure and correctly setting up the dobby shafts, the design phase is skipped. The workflow is almost the same, with the only difference being the aforementioned phase and the number of software used. In the specific program Dobby [Fig.3], everything is contained within a single window, eliminating the need for three different supports as analyzed in the previous paragraph.

## Yarns between Physical and Digital

For the research, the study of yarn and its basic characteristics was central to the digitalization process. The program offers designers the ability to import new yarns of high quality into the default library. These yarns allow for greater definition of the base textures created by the previously analyzed CAD tools. Before proceeding with the importation methodologies, it is important to note that all yarns in the library can be modified in terms of yarn count and exposure size, twist direction (S and Z), and twists per meter. This allows for achieving an even more realistic level of definition during the simulation phase. Regarding the importation methodology, the program first proposes yarn insertion from a photograph or scan. In this phase, it is crucial to strategically choose the color of the yarn (beige, light gray, off-white) because using a colored or very dark yarn may result in the loss of its details. To expand the yarn archive, the first step is to load the file into Texcelle, ensuring it is in its maximum resolution of 1200 DPI. In the CAD

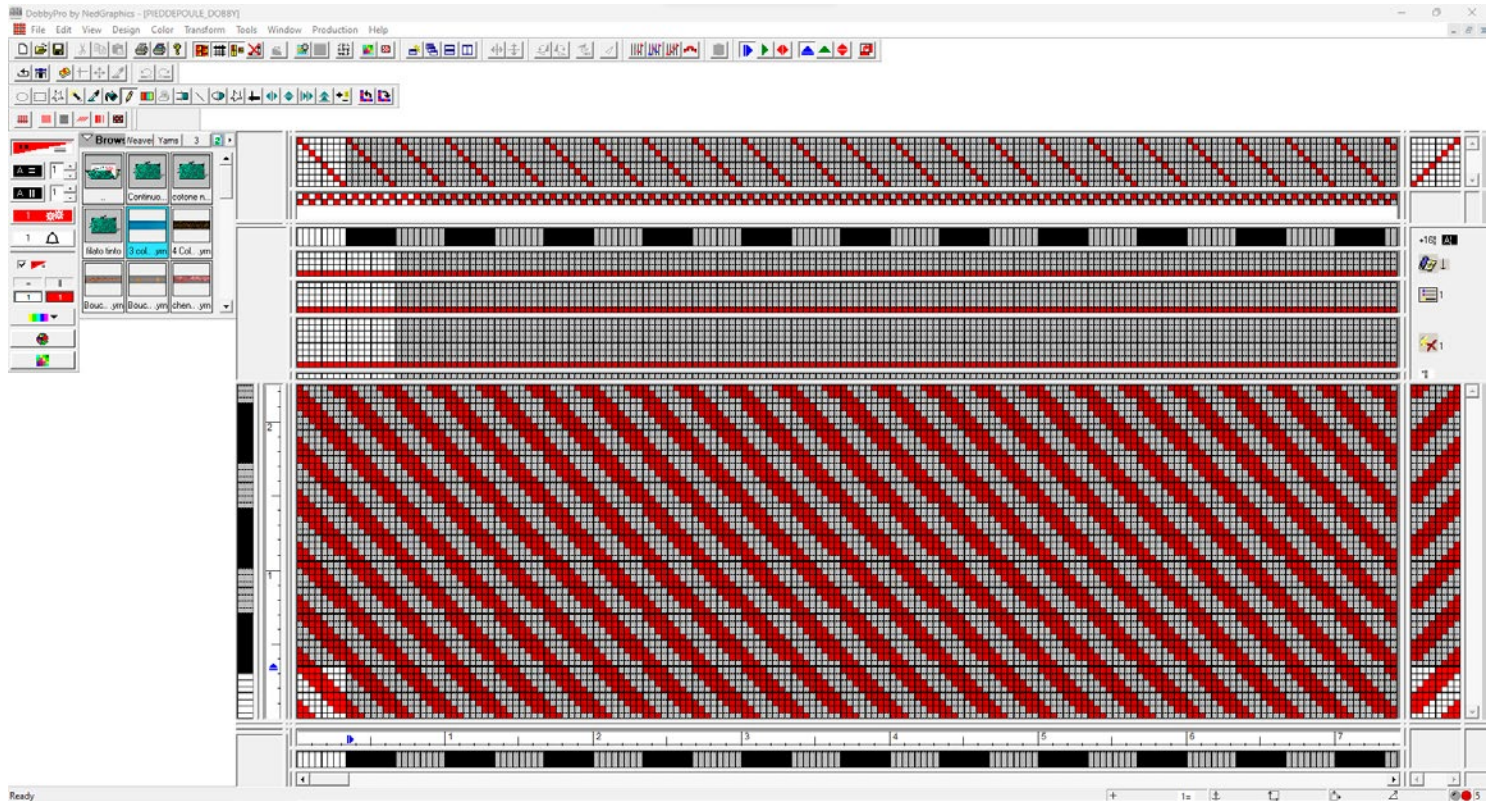


Fig. 03

program, refinement and, if necessary, correction<sup>4</sup> operations are performed, starting with color reduction in its maximum range, which is 240 shades. This allows us to preserve the shading effect and other yarn characteristics when transforming the photo into a drawing, while maintaining an excellent level of texture detail. The second step is to create a contrasting background with the yarn. The background color must be assigned to position 0 in the palette so that the CAD program can recognize and automatically remove it. The first part of the work concludes by saving this initial file as a TIFF and renaming it with “\_texture”. The essential second part to successfully complete the importation methodology is to create a mask called alpha. This is an image of the yarn with a generally black background and a contrasting color on the yarn, which enables the mapping and preservation of the aesthetic characteristics of the sample to be inserted. The final step is to insert the texture and alpha files into YarnBook, thereby completing the importation. Contrary to what one might think from the analysis presented so far, although the yarn is loaded into CAD Texcelle, it is not limited to use only on Jacquard looms. It can also be implemented for use on dobby looms and opened in the library present in CAD Dobby.

In light of this analysis, considering that yarn can be added to the library from an image, the research also experimented with the importation of digitally modeled yarns using procedural systems. The tests started with the development of a parameterized algorithm based on 3D modeling using Geometry Nodes. Through nodal geometry and combining multiple nodes together, it is possible to create complex effects and have detailed control over the object's geometry. This allowed us to systematically generate digital yarns by adjusting parameters such as twist, number and diameter of strands and individual fibers, resulting shape, and more. The outcome of this activity made a significant contribution to the research, both due to its highly innovative nature and the optimization of simulation rendering. Regarding its innovative nature, by further exploring this phase of the research, it may be possible to digitize the yarn importation process almost entirely, eliminating the need for photographs or scans. Additionally,

it would be plausible to stimulate the creativity of designers by allowing them to invent and design entirely new yarns, which would be the result of their creative inspiration, with subsequent feasibility verification using the tools in the NedGraphics package. Regarding the improvement of simulation rendering, it was observed that, at the same resolution, a fabric with yarn generated using the algorithm developed in the research phase has significantly higher quality compared to a scanned or photographed yarn.

## Mapping

Before proceeding with the dressing phase, where the digitalized fabric textures were applied to 3D models, it was considered essential during the process, once the 2D fabric texture was acquired, to use a mapping procedure. This was done to further enhance the features and give the texture, and therefore the 3D model, an even more pronounced three-dimensional effect. When referring to mapping, it is the practice of selecting, manipulating, and visually and spatially representing relationships in a “new” form, in order to illustrate or reproduce a particular salience (Manchia, 2015). In other words, with multilevel maps, we are able to give our three-dimensional model, to which we will apply the final texture (diffuse map) extracted from the entire CAD process, various aesthetic components such as roughness, transparency, opacity, etc. All the images derived from the diffuse map define a particular area of the texture and can be overlapped in such a way that, layer by layer, they together provide all the three-dimensional details that would be lost with only the base texture. The software used for generating the images is Materialize, a specific parametric texture generator. In the design phase, for highly complex fabrics or those with particular aesthetic characteristics, the manual filling of specific textures has been indispensable. This allowed us to generate specific maps [Fig.4] useful for simulating the fabric's fuzziness or opacity. This technique has been very important to fill in the gaps inherent in CAD, such as the reconstruction of fabric fuzziness, which is an important characteristic of our samples and was lost in the CAD simulation.

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<sup>4</sup> Operations of thread realignment due to errors in modular repetition.



Fig. 04

## Redesign

The last part of the research work focused on a complex redesign process in order to initiate a dissemination cycle that would showcase the obtained results and generate increased interest from stakeholders in the work done. The purpose in this case was conveyed through the creation of film content strategically divided by themes. Specifically, there was an introductory section related to the research work and the chosen fabrics, emphasizing their aesthetics and heritage, followed by three main sections divided into fashion, product, and textile macro areas. The goal in this case was to showcase the potential of the fabrics through the modeling and subsequent rendering of a capsule collection of ten garments and iconic products in the world of design and art. All these models then existed in the digital space of the metaverse, where users can interact in the virtual environment, observing the products and enjoying the audiovisual content created in the first phase of the redesign cycle. The digital reworking involved not only the simple application of fabric textures on contemporary design objects and fashion items but also the exploration of

variations in fabric colors through the study of color variants and the investigation of formal alterations in terms of pattern size.

## New Perspectives and Life Scenarios

Based on the analyzed processes in the previous paragraphs, some significant unresolved issues have been observed, further complicating the digitization process. The first aspect to emphasize, perhaps the most important one, concerns the surface finishing of the fabrics or the simulation of their pile. In this case, the studied CAD was unable to provide an optimal surface representation of the selected samples, resorting to workarounds that made the digitization process longer and more complex. The strategies employed, as seen in the mapping paragraph, involved creating specific fur mappings or converting the particle system into a mesh. This advanced level of modeling significantly extended the rendering time and did not entirely solve the issues related to the external representation of the fabric. One more challenge to consider was the aesthetic rendering of certain selected samples belonging to the Museo del Tessuto di Prato group. In this case, most of the designated designs were velvet artifacts, obtained

mostly through post-weaving processes that gave them a particular character. Although the CAD offers specific tools for simulating velvet, the final result of the representation did not meet the intended objective, partly due to the absence of a yarn in the YarnBook library that fully represented the physical and aesthetic characteristics of velvet. In this specific case, the problem was initially addressed by utilizing the software Clo3D, which includes a specific preset for velvet, and subsequently through lighting techniques that enhanced its aesthetics. For the yarn, a selection was made to find one that closely approximated the intended result for the mentioned fabrics. Another complexity arose from technicalities related to the production of fabrics using different shafts in dobby looms. The specific CAD software, Dobby, did not have a methodology capable of meeting the technical specifications. During the research period, the software was updated and implemented by the manufacturer with the addition of a technique that allowed the use of multiple shafts simultaneously. However, the upgrade failed to generate the pattern of the chosen fabric, resulting in the digitalization of multi-shaft fabrics using other programs. The analysis presented so far highlights interesting points for reflection that could lead to an innovation scenario in the field of textiles, design, and fashion design. Firstly, by combining multiple software, immersive experiences could be created that leverage the strengths of both the physical and digital worlds in a phygital approach. It is worth noting that from a strictly digital perspective, what has been studied and presented previously is still an experimental area, as digitizing complex fabrics<sup>5</sup> (as explained in the analysis) presents unresolved challenges. Another aspect to consider is that several museums do not have enough space or materials to exhibit all their artifacts. Many of these artifacts, such as the samples from the Museo del Tessuto di Prato, are fragile and cannot be displayed. One solution to this problem could be the creation of a digital archive that showcases historical pieces that cannot be exhibited, generating interest among visitors. Typically, the interaction of spectators with physical museum objects is limited, as they cannot be shown from all angles, preventing visitors from examining them in a 360-degree view. The

digital archive would offer innovative solutions for these institutions, leveraging the digitization methodologies discussed in the contribution (Arayapan et al., 2022). Another horizon of innovation lies in the prototyping process, as reverse engineering techniques reduce the time to market, thanks to the CAD's ability to quickly perform style checks and study variations (both in form and color). Furthermore, new perspectives and life scenarios open up for archival fabrics from both companies, as they can be contemporized through redesign approaches. In the fashion and textile industry, software such as Clo3D can provide valuable assistance by enabling immediate stylistic comparisons. On one hand, companies like Marini Industrie Spa can showcase their fabrics applied to 3D models, increasing stakeholders' interest, and on the other hand, museum institutions can digitally revive their textile imagination.

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## Figure Captions:

- Fig. 01: Real fabric sample from the 1500s.  
Fig 02: Digital fabric with "basket weave" pattern from 1580-1620.  
Fig 03: Digitization of Pied De Poule through Cad Dobby.  
Fig 04: Example of multi-level map: Ambient Occlusion (AO) of the 1500s fabric.

<sup>5</sup> Specifically, this refers to fabrics with significant surface details such as fur, wrinkles, ruffles, etc.

# MODAL EVENTS AND A.I. FASHION

## MATHEMATICS AND ARTIFICIAL INTELLIGENCE BETWEEN PRESENT AND FUTURE

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## Abstract

The contribution brings together some initial reflections of an ongoing research on the relationship between fashion and artificial intelligence. Within the theoretical framework of posthuman fashion, some international case studies, which represent the first experiments of introducing A.I. in fashion design, will be analysed. From here, reflection will involve the role of numbers, big data and static probability in this dynamic field of research and innovation. The aim of this contribution is to question the current and future role of fashion designers and how the fashion system could change through human-machine collaboration.

**Keywords:** Artificial Intelligence, Posthuman Fashion, Artificial Creativity, Big Data, Probability

## Introduction

In recent months, artificial intelligence has been introducing itself vigorously and very rapidly into various design disciplines, and fashion represents an area of strong experimentation. The development of A.I. software and platforms, in many cases open source, allows anyone to explore possible collaborations between humans and artificial intelligence, even without programming and computer code writing skills. Therefore, it seems urgent to question the future prospects and expectations of the role of artificial intelligence in fashion's creative, production, communication, and distribution processes, with its consequences on the professional skills required and those that may become redundant. The contribution brings together the initial reflections of a research path that aims to observe and investigate these phenomena, hypothesizing possible changes in fashion design in the role of designers with the development of A.I.

The purpose of this essay is to outline a picture of the current reality, investigating early experiences of the use of artificial intelligence in fashion; evaluating perspectives related to design

and designers; and developing a reflection in mathematical terms on the potential of this tool and the synergy between creative and machine.

## A.I. in the Posthuman Fashion Perspective

It is first necessary to clarify what is meant by artificial intelligence: the possibility of establishing through machines, technologies and software connections between various pieces of information that are immediately related in a manner similar to that of human intelligence. The scientific literature related to the applications of artificial intelligence in the fashion system is still at an early stage, going mainly to investigate its use in marketing strategies through the analysis of big data (Barile & Sugiyama, 2020; Silva et al., 2020). More developed, on the other hand, is the theoretical reflection on the relations between human and technology in fashion, particularly through contributions developed from philosophical theories on posthuman (Braidotti, 2013) and cyborg (Haraway, 2016).

Related to the topic on the Anthropocene, Anneke Smelik, professor of "Visual Culture" at the Dutch

University of Radboud Nijmegen. In a lecture given at the Iuav University of Venice in March 2022, she emphasized how human activity has radically changed the planet; and questioned what it means to live in the age of humanity. In Smelik's posthuman perspective, the nonhuman is also included; in fact, his lecture focused on ontological questions related to human beings and their responsibility to the planet, humans themselves, animals and plants. Smelik introduced the concept of New Materialism (2018) by highlighting what may be new directions for studies in the field of fashion. In doing so, non-human factors are highlighted in the field and in research that is dropped into a posthuman context, where we insist on the study of the most standard raw materials such as cotton, all the way to smart materials such as the "solar film" proposed by MIT.

Within this framework are the first experiments in the application of A.I. in the fashion system, which initially involved sales processes and concerned companies such as Yoox and Amazon. In 2017, during a workshop on machine learning and fashion, Amazon said that a group of researchers at the company is studying the prospect of collecting images of a certain fashion style and then, through an algorithm, reproducing similar but new patterns based on those images (Knight, 2017). The specific algorithm is called GAN (Generative Adversarial Network), a subset of artificial intelligence used in machine learning. The GAN technique generates photographs that are synthetic but look authentic to the naked eye. "There's been a lot of movement in this by companies like Amazon trying to understand how fashion is developing in the world," Kavita Bala professor in computer science at Cornell University told the MIT Technology Review conference. Another example is the YooxMirror project presented in December 2018 by Italian online retail company Yoox Net-A-Porter (YNAP).<sup>1</sup> This application, supported by artificial intelligence, is designed as a virtual fitting room that offers users an interactive experience in which they can virtually match and wear clothes and accessories, share them on social networks, and eventually purchase them (Vaccari & Franzo, 2022; Giano, 2019). A further example of the early experiments of artificial intelligence in fashion is the case of

influencer Miquela Sousa aka "Lil Miquela" a California model and singer influencer, star of emblematic fashion campaigns along with Millie Bobby Brown and Bella Hadid. Lil Miquela is an image, she does not exist in physical reality, yet she has a rather relevant incidence in the social world and by corollary in the fashion world (Pantano, 2018). The profile is channeled on fashion and lifestyle and is in the hands of the U.S.-based Brud Company, which took the project to Milan Fashion Week 2018 in collaboration with Prada.

These early examples of the introduction of A.I. into communication and sales processes underscore how it is a clear asset from the perspective of the seller in direct relationship with the consumer, limited, however, in the last segments of the supply chain. Significant, however, are the current implications and possible evolutions of the spread of A.I. in various areas of the fashion system (Beckwith, 2019; Catricalà & Maccallini, 2021). A study, conducted by a team at Princeton University, investigated with respect to the changes that will occur in the occupations and jobs most at risk. It found that due in part to development in the field of robotics, the entire assembly-related sector could be converted, as well as for job profiles related to photography, press officers and trend researchers. In other areas, too, there are clear signs of a rapid change in occupations and skills in the coming years. One example is the statement by Arvind Krishna, CEO of IBM, who in an interview with Bloomberg in May 2023 outlined the company's near future: in the next five years, 30 percent of back-office roles will be replaced with artificial intelligence going on to replace about seven thousand eight hundred workers and consequent salaries (Ford, 2023). On such a recent and little-analyzed phenomenon, opinions are divided over the complete use of A.I. However, one example that can be considered virtuous is the child of the joint venture between Mermec Engineering and Temera, where the intent becomes to rely on artificial intelligence to recover warehouse inventories and go on to conceive an entirely new product. Of particular note is the use of the multi-modal identification system, which involves the use of Rfid (radio frequency identification) technologies, guaranteeing the recognition and therefore the material definition of any object taken into consideration. This type of artificial intelligence is called "weak A.I." and has been the most widely used for more than twenty years, although consumers are not fully aware of it as it is often confused with "strong A.I." or A.S.I.

<sup>1</sup> <https://www.ynap.com/news/be-your-own-avatar-yooxmirror-reloaded/>



(Artificial Super Intelligence) in its most basic form would be able to act exactly like a human being: making programs, solving problems and learning. At its most basic it would far exceed the intelligence of the human brain. However, its use is still in the experimental stage and does not find any real resonance or practical uses.

This paper, however, intends to focus the analysis from human-machine collaboration in the fashion design stages. Adding artificial intelligence to current production chains and creative processes would mean providing the creative person with tools that can help him or her, for example, in managing collections, deciphering trends, cataloging work, and minimizing material waste. Through a desk analysis, some cases of A.I. use in the fashion design stages were evaluated, looking at how it collaborates with or replaces the fashion designer.

### **Fashion Designers and Artificial Creativity**

Nike has decided to exploit, starting in 2019, predictive possibilities by relying on artificial intelligence by acquiring Celect, a company that operates in the field of predictive technologies in retail shopping and analysis of shopping habits (Pitozzi, 2019). This perspective marks a clear direction relative to the designer's work. In addition, this process saves the consumer time and money, logistically cutting down the problem of inventory in the warehouse and thus of space and energy consumption, and giving the designer the freedom about the project with respect to new collections coming out, not having to take into account the limitations given by sales but taking advantage of the predictions provided by A.I. to more easily define a line-up and inventory.

The intermingling of fashion and artificial intelligence seems to have entered by right among the tools designers use to think and produce their designs albeit with sporadic case histories. From the development of a theme, which agrees with the indications arising from trend research, to image research, to the design of a collection, pattern making, fabric consumption, and so on, A.I. would potentially have the opportunity to enter, as a designer-friendly tool, and not as a replacement, into each of these chains. Since 2005, the Dutch designer Anouk Wipprecht, making use of "Arduino," a hardware platform conceived and developed by members of the Interaction Design

Institute in Ivrea, has begun to work synergistically with I.A., creating a meaningful relationship between fashion robotics and design. Starting from the use of robotic-computer tools, the designer, insists on the theme of "wellbeing," indirectly declaring her desire to use A.I. as a resource to design and produce fashion objects at the service of the human being, bringing him back to a more genuine, primordial relationship towards clothing; something that allows, not only to cover oneself, but also able to measure bio-medical data or regulate sweating. Another of the noteworthy cases is that of Levi's, which has stated that it wants to pair its models, in the flesh, with models generated with artificial intelligence, an idea by the way already perpetuated back in 2006 by Alexander McQueen when he decided to bring the hologram of model Kate Moss to the runway. Another virtuous example is that of The Fabricant. Amber Stoolen, the brand's co-founder, recently unveiled "The Fabricant Studio": a real creative space in digital format where users have the opportunity to create a wardrobe in the metaverse. According to the developers, the platform was created to allow anyone to identify with a digital fashion designer, and its implementation could provide significant help to the designers themselves (Crook, 2021). We could then begin to get used to the marriage between A.I. and the creative, in that the creative himself would have at his disposal a "weapon" that he could make use of. A tool capable of speeding up some aspects of creativity, such as the availability of materials on which to base research, in order to give the right breathing space to others, such as the choice of a meaning and therefore of a meaning, of a message, to be conferred on the designer's work, a change of course that is set to guide the fashion industry toward a new reality made up of priorities, downsizing the rhythms of production and elaboration of ideas that fashion has adopted for several years.

The spread of A.I. in fashion led to the first Fashion Week entirely dedicated to this theme<sup>2</sup>. In April 2023, the latest innovations in the computer-technological world in relation to fashion were presented, outlining a new image and avant-garde imagery. The main objective of this event is to bring out what the possibilities of the IT sector are in

<sup>2</sup> <https://fashionweek.ai/>

relation to the fashion world in an attempt to secure a new perspective for the industry. This initiative is credited with encouraging more than 350 designers to step into the spotlight and showcase creations that would otherwise never have been made or would not have enjoyed the visibility of the event, held in New York at the Spring Studio. This allows new designers to experiment with AI-based generative technologies while lowering material consumption. For the designers, pushed into a new kind of experimentation, in this event, they are motivated by the great visibility offered by the event and the opportunity to produce their garments materially, thanks to the collaboration with e-tailer Revolve Group, once they are awarded. There are about ninety garments produced, but during the event it was possible to see about a hundred times more, however, the message of A.I. Fashion Week is of value since, in its desire to offer a virtual fashion show, it does not lose its contact with reality and its more material aspects.

### **A.I. and its Usability**

Those who work with Artificial Intelligence, particularly developers, generally are familiar with the mathematical world more specifically with algorithms, which are applied to empower A.I. to solve problems and have decision-making capabilities. The mathematical study within this reality also extends to principal component analysis (PCA) and singular value decomposition (SVD), which are used to optimize and decrease the volume of data in order to improve the performance of artificial intelligence systems by making them smoother. The study of statistics and probability makes it possible to make clearer reading of data, giving the ability to make predictions even on uncertain or incomplete models. The 'use of Bayes' theorem for example, is used to trace the causes of an event that has already occurred; this allows scholars to intersect different sources in order to be able to reshape the inputs that artificial intelligence uses in its processing and thus in its work. Mathematics, the foundation of artificial intelligence, provides the tools to design and update sophisticated algorithms that enable machines to emulate human intelligence. Below the paper introduces a reflection on statistics with the aim of raising questions about the relationship between artificial intelligence and fashion, an interpenetration between numerical

issues and qualitative approaches, between hard science and soft science. A.I. raises a number of issues, such as the opacity of decision-making and discrimination. Skepticism toward artificial intelligence comes very close to the definition in the mathematical world of a paradox i.e., the description of a fact that contradicts common opinion or everyday experience, thus succeeding in being surprising, extraordinary or bizarre and thus in some cases capable of generating distrust. First point, essential to the research, is to define its object itself. From the empirical point of view, fashion is a set of what are referred to in mathematical circles as Events, that is, the set of results to which a degree of consistency, defined by an objective reality, is assigned or noted, unambiguous and well-defined. To make the concept clearer, we could define the future of an event as the print creation (event 1), on a certain type of fabric (event 2), dedicated to a dress (event 3), which will be mass produced (event 4) and sold in a certain country (event 5). A physical-mathematical concept of timelessness must be integrated with the proposed incipit; Time is a universally agreed perception as a mode of succession of events and the relationship between them. This implies that events in the physical world are determined by the structures determined by the observer as demonstrated by Albert Einstein with the discovery of "General Relativity". Relative to the analysis conducted, the concept of time is untethered from the demonstration since no factors determined by "delta t" result in combinatorial and statistical calculus. This element corroborates, albeit in a theoretical way, the concept of relativity related to a system. The fashion world does not consider the canonical annual time period, but instead relies on expedients related to seasonality, punctuated by the publication of magazines, the release of collections, articles, photographs, collaborations, and so on. In short, we consider time in fashion to be a character inextricably linked to the historical period but capable of dilating (referring instead to the canonical system of dividing time (hours, days, months, years, decades, centuries). Having defined the concept of the timelessness of fashion, in statistical terms, we can reason about the definition of fashion as an event or rather the union of several events combined with each other. Cataloging and defining these events is possible, however, a preliminary analysis must be carried out, where the parameters of evaluation are defined. These parameters may relate to matter, place or even time, for just as it is true that time is relative,

it is equally true as emphasized and demonstrated by Lorentz and Minkowski that space and time as independent systems do not subsist, but fall within the realm of physics, the experimental one, and it is the union of the two that preserves independent reality. There is already a definition of fashion in the mathematical world: fashion corresponds to the modal value, the value that occurs with greater frequency and admits more useful outcomes. The graph representing fashion is constructed by the intersection of the y-axis, where the frequency is indicated, that is, how many times a given event occurs, and the x-axis, the “mode,” that is, what type of event. Events as we pointed out earlier can include any element valid to statistical evaluation and analysis of the graph. What is ascribable graphically falls under the domain of statistics. From statistics, i.e., the evaluation of events that have already occurred, one moves to probability, i.e., the combination of events that have yet to occur.

This falls under the realm of probability, it is clear that trendforecasting companies such as WGSN (World’s Global Style Network) promote a research practice where the presence of data is of strong relevance, but it is also true that, given the scope of the research, data analysis and predictions based on combinatorial calculus alone are not perpetuated, but the reading is entrusted to humanistic subjects such as anthropology or psychology (Dall’Aglio, 2003). In this way, they are able to provide detailed reports to thousands of fashion companies by analyzing macro and micro trends, which have strategic importance for the choices of designers and entrepreneurs, especially in international circles. The case I would like to theorize finds several points of contact with a mathematical paradox. It should first be clarified that a mathematical paradox is different from antinomy, that is, a logical contradiction, but instead a result that is different from that which is related to man’s natural intuition. In this particular case, it is pointed out that the possibility that in a group of people at least two will have their birthdays on the same day (the fashion of that group), is much higher than one might guess. The days to be considered are 365, the same probability of birth is given to each day. This data suggests that to have a 50 percent chance we would need half as many people as days. This is not the case. To have a 50.7% chance, 23 people are sufficient; with 50 people we get to 97%. The most effective method to calculate this possibility is to calculate the nonpossibility. That is, we calculate the

complementary of the number we are looking for. This means that the fashion in a sense is predictable on a large scale, the more we go into detail the more the events increase, it is as if we increase the days to consider, no longer 365 but for example a hundred times as many, but it is also true that we would have more elements to take into account, that is, the people we consider in our sampling frame.

## Conclusions

In order to make the most of artificial intelligence, it is necessary to create the right culture around the phenomenon, avoiding the problems that impede the progress of research in this regard; it means creating a working culture that fully supports the A.I. ecosystem. In addition, there is an urgent need to raise public awareness of the use and ‘integration of A.I. into mass culture. From what emerged in the previous paragraph, this reality still seems to be perceived not as a favorable tool but as disruptive to daily experience or even controlling. By permeating into the all-round population, A.I. can be the tool that can bring out new designers, new artists, to further democratize creative processes.

The conclusion of this reflection is one related to the possibility of archiving; fashion uses very rarefied parameters, not precise units. This complicates the possibility of data collection and its subsequent reworking by the designer. Should the process of data collection be totally digitized, we would have the possibility of calculating, first on a large scale and then in the specifics of the individual garment whether something will be trendy or not, reasoning about the likelihood of this event happening, and furthermore we would be able to use these tools as an additional resource available to the creative. The stages of writing, photographic research, and drawing would be enriched by a new tool that would provide a greater mapping of the instances and inputs that the designer uses to design, also improving the possible “gestation” and elaboration period of the project.

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