ENDLESS CARING

A new paradigm of sustainable fashion

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We would like to thank professor Paola Bertola, for guiding us continously throughout this long journey and within the fashion world.

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We dedicate this work to our families and loved ones for their support and encouragement through thick and thin.

We dedicate this work to our friends and all young people, who face with us the uncertainties of future perspectives. Together we can be the change that is needed.

Marco e Matteo

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ABSTRACT

ENGLISH

Fashion is a transformative force that molds our world by acting on a blurred boundary between art and cultural heritage. Besides its transformative power, fashion industry is a complex system that in recent years has been dominated by the fast fashion model. The acceleration of purchasing coupled with the devaluation of products have caused the overall production to dramatically grow, worsening the already harsh value chain unbalances and environmental impacts of fashion. 2020 will be remembered as a year of major changes for both people and businesses. Fashion industry resulted as one of the most affected sectors due to a combination of severe supply and demand shocks. Besides, the pandemic awakened social consciousness that is putting pressure upon fashion companies to pursue a transition towards new sustainable business models. This implies rethinking companies' priorities by balancing economic, environmental, social and cultural goals.

Though, we need guidance in this uncertain moment so that this opportunity of change is not wasted. In our research we try to anticipate the evolution of fashion until 2030, not with the aim of forecasting but to propose a transition pathway towards a preferred future. We applied future studies methodologies to develop three alternative scenarios, each devised from different attitude emerging in the post pandemic landscape: isolation, responsibility and criticism. *Digital Immersion* is a scenario that relocates fashion in a fully virtual reality avoiding almost all physical production. *Endless Caring* enables different levels of circularity, extending product life and eliminating waste generation. *Fashion Activism* redefine value chain in a regional scale allowing brands to represent people culture and labor.

Scenarios potential impacts have been assessed consistently with the Sustainable Development Goals and we identified our preferred future in the *Endless Caring* scenario because of both the positive outcomes and the complexity of a transition from the current reality. The transition pathway articulates in three distinctive phases. *Education,* which is crucial to stimulate the dialogue and create a shared vision as well as the right attitude. *Acceptance* involves the application of the most immediate solutions and prepare the ground for more radical innovations. Finally, in the *Conversion* phase the value chain undergoes even the most radical transformations and reach the full potential envisioned.

KEYWORDS: Sustainability; Fashion 2030; Transformative Innovation; Covid Pandemic; Future Scenario; Transition Pathway; Business Actions.

ESTRATTO

ITALIANO

La moda è una forza trasformatrice che plasma il nostro mondo agendo su un confine labile tra arte e cultura. Oltre al suo potere trasformativo, l'industria della moda è un sistema complesso che negli ultimi anni è stato dominato dal modello fast fashion. L'accelerazione degli acquisti unita alla svalutazione dei prodotti hanno fatto crescere drammaticamente la produzione complessiva, accentuando i già gravi squilibri della value chain e gli impatti ambientali della moda. Il 2020 sarà ricordato come un anno di grandi cambiamenti sia per le persone che per le imprese. L'industria della moda è stata uno dei settori più colpiti a causa di una combinazione di gravi shock di domanda e offerta. Inoltre, la pandemia ha risvegliato la coscienza sociale, che pone pressione sulle aziende di moda per perseguire una transizione verso nuovi modelli di business sostenibili. Questo implica un ripensamento delle priorità aziendali, bilanciando obiettivi economici, ambientali, sociali e culturali.

Tuttavia, abbiamo bisogno di una guida in questo momento incerto in modo che questa opportunità di cambiamento non venga sprecata. Nella nostra ricerca cerchiamo di anticipare l'evoluzione della moda fino al 2030, non con lo scopo di fare previsioni ma di proporre un percorso di transizione verso un futuro preferibile. Abbiamo applicato le metodologie di future studies per sviluppare tre scenari alternativi, ognuno concepito a partire da un diverso atteggiamento che emerge nel panorama post pandemico: isolamento, responsabilità e critica. *Digital Immersion* è uno scenario che trasferisce la moda in una realtà completamente virtuale evitando quasi tutta la produzione fisica. *Endless Caring* attiva diversi livelli di circolarità, estendendo la vita del prodotto ed eliminando la generazione di rifiuti. *Fashion Activism* ridefinisce la value chain su scala regionale permettendo ai brand di rappresentare la cultura e il lavoro delle persone.

Gli impatti potenziali degli scenari sono stati valutati coerentemente con i Sustainable Development Goals e abbiamo identificato il nostro futuro preferibile nello scenario Endless Caring sia per i risultati positivi sia per la complessità di una transizione dallo stato attuale. Il percorso di transizione si articola in tre fasi distinte. *Educazione*, che è cruciale per stimolare il dialogo e creare una visione condivisa così come il giusto atteggiamento. *Accettazione* comporta l'applicazione delle soluzioni più immediate e prepara il terreno per innovazioni più radicali. Infine, nella fase di *Conversione* la value chain subisce le trasformazioni più radicali e raggiungere il pieno potenziale previsto.

PAROLE CHIAVE: Sostenibilità; Moda 2030; Innovazione Trasformativa; Pandemia Covid; Scenario Futuro; Percorso di Transizione; Business Actions.

EXECUTIVE SUMMARY

INTRODUCTION

We are living in uncertain times: climate change is threatening our future, social inequities are fueling tensions throughout the world, Covid-19 disrupted our lives and our socioeconomic system. The leading class is under close watch since digital technologies have broken barriers to access information and people demand more and more *facts*, rather than promises and commitments. In this context, fashion reportedly is known as an extremely un-sustainable business and only recently players have started to focus their efforts on these themes. We cannot accept that fashion is perceived in this way, because we love what it represents as cultural intensive industry. Fashion is a wonderful representation of people and our society, and it follows their evolution along time. The question is then how to transform this industry, how to make fashion sustainable?
The goal of our research is to answer this question and to do so we have been on a journey that starts from the present, reach 2030 to see a different paradigm of fashion in action, and gets backward to the present so that we can understand which transition process is needed to make that future real. This dossier follows our journey, and it is then structured in 3 parts: *Interpreting the present*, which contains the literature review and methodology background, *Envisioning the Future*, which is the foresight work itself, and *Paving the Pathway*, which design the transition process.

PART I – INTERPRETING THE PRESENT

The first part of this dossier is oriented to the present and its goal is to capture as much as possible teachings that present situation offer. Metaphorically, this is the phase in which we prepare our luggage and collect all the tools that may be useful before projecting in the future. Two chapters compose this first part. *Literature Review* offer a wide and thorough perspective on the key topics of interest for our research: Fashion Industry dynamics, Covid-19 Disruption, Sustainability, and Future Generations. *Research Gap & Methodology* identify the gap we wanted to fill with our research and provide a solid background for our methodology.

1. LITERATURE REVIEW

CHAPTER 1
We chose fashion because it is a lense to interpret people and our society, because it has the power to transform our world and future, and finally because it is a wide and complex industrial system, which though has extensive margins for improvement. In this first chapter, we introduce the global fashion industry taking a pre-pandemic perspective. This is to describe an unbiased scenario and remark those long-lasting changes that were already happening within our society before the pandemic outbreak. At first, we take an even wider look at our society, observing how it is fueled with tensions and uncertainties for the future. Inevitably, the socio-economic system is affected, and fashion industry is no exception. Despite this tense scenario, fashion companies can understand the evolution of our society and drive the evolution of mankind.

Fashion industry is surely globalized, still there are significant unbalances in terms of markets relevance. Emerging Asia Pacific and emerging Europe are progressively rebalancing sales distribution, as well as Russia, Middle East, Latin America, and Africa, who are though experiences more economic and political challenges, likely to dampen consumer spending. Sectors within the fashion industry are also showing signs of umbalances, with middle-field positioning more and more under pressure from both value and luxury. Middle-ground positioning is a very risky strategy that may hamper survival, since people may not perceive the uniqueness of a brand identity. Despite the large number of firms operating in the industry, only few own great market power and drive the whole industry results, a phenomenon called industry polarization. Comparing the geographical areas, fashion industry is nearly a monopolistic market, with Europe and North America seizing most of the value generated. To conclude this first chapter we focus on Italy, given the relevance of Italian fashion both from a global and national perspective. The most effective positioning for Italian companies is high-quality and crafted products because of their appreciation abroad. Moreover, the district organization of Italian manufacturing system, made of smaller size companies, enable flexibility and an attituted for innovation.

CHAPTER 2

If Chapter 1 has the goal of studying the fashion industry from a pre-pandemic perspective, Chapter 2 is completely centered on the Covid-19 pandemic outbreak and how it has revolutionized our world. We will indeed remember 2020 as a year of major changes for people habits, business practices and policymaker's agenda; all this makes us say that we have already begun a journey towards a new era. Apart from the sanitary emergency, the pandemic resulted in a severe economic crisis, among the worst shocks in our history. The American and European continents suffered the most from the immediate economic consequences of the outbreak. South Asia will drive the global GDP growth, along with the African continent and Central America. Policymakers has behaved like tightrope walkers, finding continuously the perfect balance between containment policies and economic stimuli, to keep the death toll low and at the same time minimize the economic recession.

Inevitably though, restrictive measures have caused a conjunct shock of supply and demand.

From the supply side, shocks hit harsher in case industries were classified as non-essentials and mansions are generally not suitable for remote working. From the demand side, shocks were a combination of reduced spending power, with psychological and contextual factors. Consumption is indeed a complex action that is both habitual and contextual and a global pandemic represents a full-blown contextual change, and it is straightforward to expect changes in consumption patterns. Regardless of how people faced shelter-in-place orders, loneliness is expected to prevail in the post-pandemic and become a dominant psychological state. Digital technologies offered more than ever a way out, providing quasi-normal lives within the house walls. As a result, the pandemic had a catalytic effect on digital literacy, especially among the most disadvantaged with technologies. Similarly, the pandemic reduced information inequalities by revitalizing interest in public affair and accelerated the long-term structural changes of news industry. Though, a throwback of digital channels to access news, is the risk of extreme personalization and the spread of fake news. Finally, we conclude this second chapter with an immersion in a post-pandemic home, thanks to *Casa Fluida*, an exhibition from Elle Décor Italia, Elisa Ossino Studio, and Marco Bay, which explore the new meanings that home has acquired, such as comfort, flexibility, functionality and sustainability.

CHAPTER 3

This third paragraph detaches from the first chapter which aimed at identifying the long-lasting changes in act, and the goal is to depict a post-pandemic fashion scenario. The chapter opens with an economic analysis, where fashion industry emerges as one of the most affected sectors during the pandemic. This is due to the discretionary nature and low perceived urgency of products, which caused serious demand shock. The over-reliance on China for the earlier production stages, caused even more severe supply shock when lockdowns started to spread. Luxury is expected to lead the resurgence, thanks to digital channels and the Chinese market relevance. The companies that have performed better in this period are those with a large business relevance in the APAC region and with a strong focus on online channels. The overall tremendous results caused a lot of companies' financial distress, which will prompt a new wave of M&A operations. In Italy, fashion scored the worst results among the manufacturer sectors, due to mainly drop in tourism as well as supply shortages from Asia. It is expected an unemployment increase of around 30-38%. When observing economic figures, we might forget of who really paid the harsh price of this pandemic: workers. Indeed, the unbalances of actual fashion value chain caused the worst effects to be localized in the less developed countries. The pandemic has shown once again inefficiencies and inequalities of our socio-economic system and particularly of the global fashion value chain. Covid disruption opened a major opportunity to quicken the digitalization process, since fashion had a late start in this transition. DTC brands as well as pure digital players are gaining momentum especially among investors. Though, their inability of converting expectations into concrete results is shifting a bit the attitude of investors, who are now more prudent. In any case, offline channels will still be a relevant channel for fashion but collaborating with online platforms is not an option anymore. The chapter concludes by analyzing how radical changes in consumer behaviors happened, due to both shelter-in-place orders and remote working. Companies that promptly adapted to the new situation gained a relevant image advantage, which will help fight the general decrease in fashion consumption. Above all, pandemic seems to have awakened a social consciousness, which will see the raise of second-hand, repairing, localism and durable design.

CHAPTER 4

In this chapter, we finally approach one of the central themes of our research: the sustainability of the fashion industry. To address this topic, we first clarify what the term sustainability means, presenting its various declinations: environmental, social, cultural, and economic sustainability. As of today fashion industry is definitely unsustainable especially after the affirmation of the fast-fashion model and the unbalanced distribution of global value chains. From the environmental point of view fashion is the second most polluting industry, impacting on emissions, water consumption and pollution, microplastics released and chemicals utilization. Regarding social sustainability, speed and competitiveness resulted in pure employment conditions, to the point that we talk about modern slavery and child labor. Cultural appropriation is an issue that gained visibility thanks to social media, reveling cases of plagiarism, exoticism and stereotyping. The major hurdle is to combine these three perspectives with economic sustainability, which means offering affordable prices. Given the urgency of this topic, several reporting efforts have been made to evaluate the as-is situation of the industry: sustainable investments have increased sharply in recent years, though very often companies are involved in greenwashing and misleading advertisement. Large companies and especially giant sport players are the most sustainable, thanks primarily to the immense resource available for sustainable investments. In terms of activities, production, packaging and all the physical activities as well as transparency are unsatisfying. Only commitments and target setting are assessed positively, which highlights the gap between words and deeds. Further evidence comes from the numerous international agreements and policies to counteract climate and social crisis such as Fashion Pact and 2030 Agenda for Sustainable Development, which introduced the widespread Sustainable Development Goals. Single companies have begun to adopt Corporate Social Responsibility which is the voluntary integration of social and environmental issue in business operation and relation, with a focus on shared value creation and societal progress. Companies also need to communicate to the final users the commitments; sustainability and ethic reports are increasingly adopted as well as third-party certification such as B-Corp.

The fourth chapter concludes with a presentation of the more sustainable business models, resale, rental and subscriptions, virtuous examples of alternative ways of doing fashion which break the current linear value chain and enable circular systems. This models are meeting a favourable environment due to shifting of consumer preferences as well as technological progresses.

CHAPTER 5

In this fifth chapter we have focused on the fashion value chain reflecting on the catalytic effect that Covid-19 had in transforming B2B relationship and moving the industry towards a 4.0 paradigm. Indeed, the pandemic has put increasing pressure on global supply chain, showing the lack of flexibility and resilience. It also highlighted the potentialities of digital solution. To cope with restrictive measures many processes have been streamlined, with a positive effect also on costs. Virtual sampling streamlines product development avoiding the production of physical samples which results in a 35% reduction in time to market and make it possible to satisfy the desire for customization typical of Gen Z. With digital showroom brands can present collections and collect orders online. Moreover, B2B ordering platforms allow to serve small customers in a convenient way. Digital technologies adoption has a positive effect on production costs, which shrinks the gap with manufacturing hubs that offer low labour costs exploiting social inequities. This is why nearshoring has accelerated during the pandemic, with the goal of improving the resiliency of value chain. Though shorter supply chain are beneficial collaboration across the value chain is crucial for achieving a flexible, consumer-centric supply chain and making industrywide progress towards social and environmental sustainability. The Industry 4.0 concept should be viewed today, as a way to transcend the manufacturing-centered vision to embrace a new system made of combination of “smart factories”, “smart networks” and “smart products”. Smart factory model improve efficiency and sustainability of production by blending human unique attributes of creativity and manual dexterity with digital technologies and devices. The upstream supply chain is under investigation by consumers, who are demanding greater transparency on issues such as labor, environmental pollution, and fair labor.

New technologies such as blockchain can boost transparency among all the steps in the supply chain, creating smart networks of partners rather than supplier-buyer relationship. Finally, smart products connect supply chain with final users extending interactions beyond purchase. The metaverse, for example, is a parallel reality that acts as a mirror of the real world, where users can work, play, and communicate among them and with brands. Artificial Intelligence makes it possible to simplify the user experience at the moment of purchase, adopting the logic of "recommendation" and "next best offer", driving revenue growth of 10 to 30 %.

CHAPTER 6

In this conclusive chapter of our research we have focused on people and particularly on the younger generations: Gen Z and Millennials. Indeed, these are the generations that are growing up and will become the next generation of customers and users in the next years. With an initial identikit of the two generations, we find out they detached from older ones for their self-awareness and care, for their refuse to stay on the sidelines and readiness to act and improve the world. A common characteristic critical to explore was surely their confidence with the digital world; GenZers are the first real digital native and thanks to the vast number of smart devices at their disposal, they are considered an always-on generation. Even their own battles, such as climate change, gender equality, ethnic discrimination, have been transferred in a most comfortable environment: social media, which have become the best "organizer” for contents and protests.

Feeling anxious and even ashamed about living lifestyles that are perceived as not environmentally friendly, younger generations are more interested in changing their behaviors to become healthier and more sustainable in their day-to-day lives. Also consumption becomes a matter of ethical concern and consequently this has severe implications for businesses which must rethink how they deliver value and, more than ever, realize what they preach when they address marketing issues and work ethics. They expect companies to take a stand and demonstrate with facts their commitment. They won’t take companies on their word alone. They are a hypercognitive generation very comfortable with collecting and cross-referencing many sources of information.

The extreme confidence and spread of digital channels offer a wide range of opportunities. Though, with ever-increasing marketing and influencer content on social media, making a representative and significant online social presence stand can become risky. For example, contents need to be available simultaneously on different media, without causing any overlaps or interferences. Trans-media storytelling contributes to raising brand awareness and improving the perception of brand image, but companies need to become hyper-aware of the communication processes active in any social platforms at any moment to preserve brand reputation. To conclude the chapter, we went through some examples of future customers segmentations to understand how the literature foresees the evolution of the customer base in the years to come.

2. RESEARCH GAP & METHODOLOGY

Fashion has always evolved over time but in recent years, it has broken its pure soul and have become in recent years synonymous with consumerism. The affirmation of the fast-fashion model is to be identified as one of the responsible, since it has ignited a dangerous dynamic of lowering price and quickening purchases, which is causing tremendous negative impacts on all the dimensions of sustainability. The advent of the pandemic has made evident also the weaknesses of far in distances value chains and made fashion companies realize they must intervene and modify their sourcing mix, to better balance risks, costs and supply flexibility. At the same time the pandemic is urging companies and the whole society to adapt, which stimulate a diffused process of transformation, and fashion is no different. Though, we must ask ourselves, where is this great wave of change leading? Which will be the dominant paradigms of this new post-pandemic era? How will they adapt to the fashion reality? This is the right and one of the last opportunities for the fashion industry to radically shift paradigm, embracing more sustainable, and inclusive ways of doing business. With our research we want to give our contribution in envisioning future perspectives and a transition pathway that could concretely lead fashion companies out of the tremendous actual situation and land successfully in a preferred scenario, where fashion is an example of sustainability. Once identified the research gap to tackle, we did an extensive analysis on the best methodology to follow, which, at first glance, was not very clear. The type of innovation we wanted to design is close to a design push innovation, because it generates new meanings that drive the evolution of our socio-cultural model, before ideating practical solutions. Therefore, design thinking principles such as human-centrism, abductive thinking, and holistic approach proved to be valuable in our research. On the other hand, we leveraged on future as a space to rethink what is possible, with the goal of determining concrete actions to be taken today, which is typical of future studies and particularly of backcasting methodology. Signals are the *basic building block* of any future thinking effort and for this reason we also worked with signals.

We can recognize our research also under the concept of transformative innovation, since our society and our planet desperately need deep transformations, and what we propose is surely a radical transformation of an industry and an even wider ecosystem. Strategic thinking though is suitable to obtain incremental changes, then we need to use design and futures methods, which enable conversation about the paradigm shifts in values, ethics and societal norms that are needed. To conclude, the positioning of our own methodology is in the middle ground between future studies, design, and strategy; this allows to cope with the need of a systemic transformation that foster sustainability, but at the same time keeping a close eye to business strategy, so that we can leverage on the economic force as a driver of systemic transformations that may go even beyond the boundaries of fashion industry. To conclude the research methodology background, we introduced a *Foresight Framework* from Voros (2003), which locates the foresight work as a previous phase to strategy development, distinguishing then strategic thinking, which is about exploring options, by strategy development and planning, which imply decision making and actions implementation.

This model is articulated in 4 phases: *Inputs*, when all the information are collected, *Foresight Work*, which is the foresight process itself, *Outputs*, which collect all the tangible and intangible outcomes of the foresight work, and finally *Strategy*, where development and implementation take place.
Our research covers the first three steps of this process and concludes before the strategy development, since our outputs need to be situated in the specificities of a business environment, mainly fashion brands but also other players of the industry, to trigger strategy development and planning. In these last pages of research methodology background, we introduce all the tools that have been used during Part II and Part III, such as trends analysis, polarities approach, scenario building and backcasting.

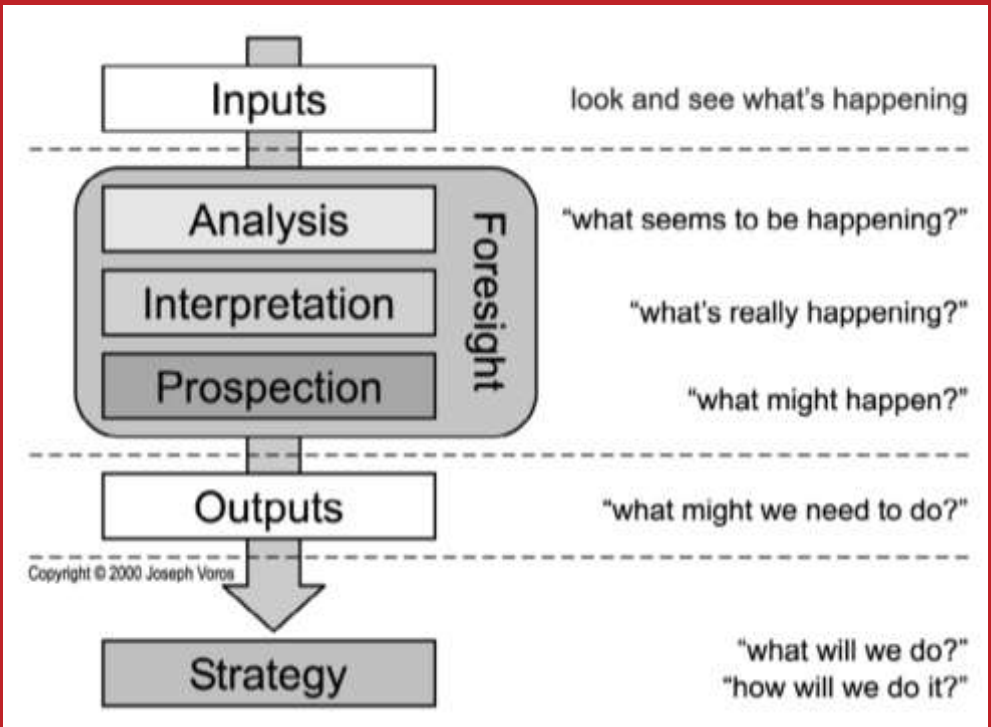


Fig. ES 1 – Foresight framework diagram in question form.
Source: Voros, 2003

PART II – ENVISIONING THE FUTURE

The second part embodies the essence of our work, since it has exclusively a future perspective and its goal is to exploit all the learnings acquired in the Part I in terms of both literature and methodologic knowledge and build future alternative scenarios. Six are the chapters composing this section, which follow the structure of the Foresight Framework introduced previously.

3. INPUTS

The first chapter coincides with the first phase of the Foresight Framework and consists of the initial process of information scanning and gathering. The inputs collected were quite diverse both in terms of format and sources. Reports from consultancy companies, industry organizations, and fashion players themselves. Research papers and books. Materials from courses of MoS in Management Engineering at Politecnico di Milano. As regard the online materials we resorted to websites of various organizations, from governments to startups and finally social media. We clustered our inputs based on the topics dealt: 45% of inputs deal with *Sustainability Assessments & Best Practices*, 26% *Future Generations Characteristics & Implications*, 24% *Technological & Business Model Innovation* and 21% *Short & Long-Term Impacts of Covid-19*. These are the main themes that have been analyzed in our literature review since that coincides with our main research. Nevertheless, during the development of the proper foresight, arouse the need for other two typologies of inputs. On one hand, we observed some other cultural intensive industries, such as *Cinema* and *Entertainment*, as well as *Figurative Art* and *Design*. This was important because these industries maintain cultural diversity which allowed us to intercept and anticipate underlying changes in act from the users' perspectives, not in terms of shopping behaviors or daily actions, but rather in deeper cognitive terms. On the other hand, other signals have been collected simply by observing reality around us and identifying those solutions that were thought provoking. Technologies, products and services, experiences, all things that are already offered in the market, especially fashion market. This last typology of inputs was useful to improve the level of details when it came to elaborate scenarios.

4. FORESIGHT

The foresight phase is composed by three subsequent stages. *Analysis* aimed at taking the large amount of information collected and try to structure them in a clearer way, creating a first sense out of the chaos. This has been done firstly by identifying the major trends emerging from our research. From the people perspective, we can cite that the *"pandemic awakened social consciousness, especially among the youth"*, and *"younger generations search for the truth, by cross-referencing information"*. From the fashion industry perspective, *"corporate social responsibility policies are being increasingly adopted"* and *"global distribution of value chain and over-reliance on Asian suppliers is proving to be and increasingly inefficient model"*. All the trends identified were analyzed along with other inputs, focused particularly on the younger generations, with the aim of identifying the dominant post-pandemic feelings, which will drive people evolution in the next decade. The first dominant sentiment identified is *Loneliness*, linked to the pandemic traumatic experience and particularly to the place rigidity that forced people away for long. The second dominant sentiment is *Shame*, which is linked to the perception that our daily behaviors contribute to the climate emergency, and the pandemic made this even more evident, since numerous observations showed how the reduction of human and industrial activities reduced drastically pollution. The third dominant sentiment is *Resentment*, linked to the resurgence of social consciousness emerged with the pandemic, which make it impossible nowadays to turn a blindside to current inequities of our society. These three dominant sentiments are not binary but rather people express a continuum of shades. For this reason, the sentiments have been elaborated into polarities, with three degrees of intensity. As for loneliness, some people completely immerse in themselves, some are only aware that their actions affect others, and others instead feel themselves as one in a community. As for shame, the first extreme is made of people that blame themselves for their daily actions being not environmentally friendly, whereas at the other extreme they do not blame themselves at all; in the midway, there is awareness that any of us is a part of the big problem. Finally, as regard resentment, some people raise their voice and fight society inequities; others are aware of these problems but have only a reactive or even passive attitude.

With the identification of the dominant sentiments and the polarization description, a much clearer idea of the inputs gather has been built. With the *interpretation* step, we moved deeper in understanding data, with the aim of finding insightful information that would help elaborate future foresights. Following the user-centered approach of our work, we started by elaborating on the three dominant sentiments previously identified. These are not mutually exclusive, but rather they coexist within all of us. None is dominant over the others, but they create inner tensions, by clashing each other. As a result, our attitude towards life, work, society, and planet, is shaped. We expect three main attitudes to arise in the post-pandemic era, which are based on the polarizations previously identified. Indeed, along with the definition of the sentiment, we have previously listed three degrees of intensity each, meaning that all of us may experience differently the same sentiment. Combining then possible intersections of relative weights of each sentiment, we were able to define three post-pandemic user attitudes that, according to us, are already partially visible in the outside world.

Isolation is the first attitude identified, which sees as a dominant sentiment loneliness, with a relevant contribution of shame; resentment is at its minimum, with a passive attitude towards society inequities. This is an attitude of self-immersion, which makes people partially lose the communitarian vision of our society.

Responsibility is the second attitude, coming from a dominance of shame, which cause people to take responsibility of one's own actions; they do not feel alone, but are especially aware of the impact they have on others. Additionally, a reactive approach to society inequities makes them drive choices especially in purchasing.

Finally, *Criticism* is an attitude dominated by resentment and willingness to raise the voice and protest the status q uo, to fight for society inequities, which is linked to the deep sense of community belonging and definitely detach from being ashamed for individual actions.

Fig. ES 2 – Post-pandemic emerging attitudes

This first interpretation on data focused only on people because our aim was to elaborate user-experience based scenario. This means that the foresights were driven by people evolution which, in our case, is represented by the three attitudes just explained. Based on these attitudes, we mapped all those signals that had been gathered according to their pertinence to attittudes. Additionally, we clustered them through three different scopes: persona, value chain and brand. This map was called *Kernel*: this name has a double meaning, on one hand, it is to represent the centrality of this map within our foresight process, on the other hand, it wants to communicate that it is only the core part of our mapping efforts. Indeed, we decided to include in our dossier only the minimum set of those most meaningful signals that could enable a full understanding of the foresights, for matter of space and brevity. Kernel is shown through three different zooms at pag XX. Additionally, three drivers of change for each attitude have been elaborated, according to the three scopes introduced.

This was to help us and readers to access in a synthetic way the main transformations that each scenario realizes. With the Kernel and drivers of change, a much deeper interpretation of data has been performed. Combining indeed attitudes, signals, and drivers of change, we had all the tools necessary to finally envision the scenarios. They have been initially represented through a sketched vision, encompassing the three scopes of our work (persona, value chain and brand) but with a rough level of detail. We progressively went deeper adding also the insights coming from signals previously excluded or searching brand new signals that were more consistent with the scenario formation. The phases of interpretation, particularly the kernel mapping, and prospection were performed in a highly iterative way. To enable an immersive experience within scenarios, we separated them within specific chapters. Also in this summary, the next three chapters are immersions into the 2030 scenarios, to give readers perceptions and feelings of the different alternatives, in terms of people, fashion but also societal evolution.

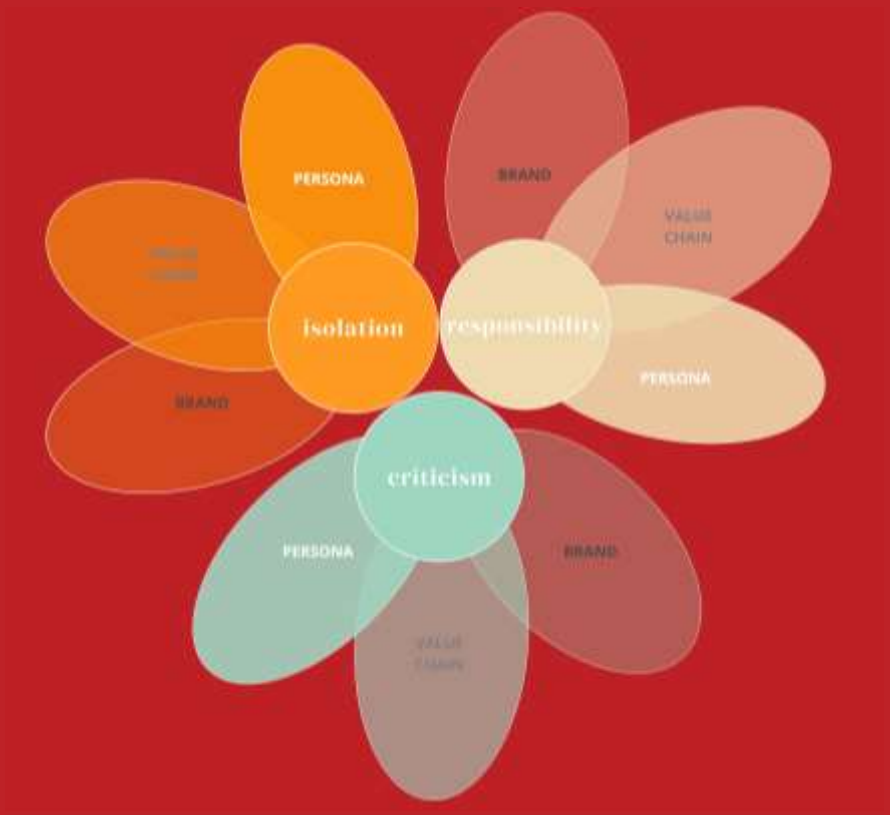


Fig. ES 3 – Representation of Kernel Structure. Authors elaboration.

5. SCENARIO 1: DIGITAL IMMERSION

The first is a scenario in which the digital pervades every aspect of reality, in which everything is or can be done in a virtual world. The fascination and the opportunities of the digital find consensus particularly among a new personality that has become common in this reality: the Introvert. Introverts have found a way to cope with their dominant sentiment of loneliness, taking refuge in these digital worlds. It is a real digital immersion, which has led them to almost alienate from the real world, considering the virtual a more attractive place than the real world. In the digital worlds, there is room for every kind of desire and need they have, from education to sports to work. Social media have been the first to evolve towards a more immersive reality thanks to the creation of a parallel reality, the metaverse, which has become a new frontier of communication and has opened new spaces for sociality. Thanks to the use of avatars, people can move through the metaverse as if they were in the real world. They can meet new friends, take a walk, and can even make purchases for their avatars, such as clothes. Shopping is transformed and transferred in the virtual reality. With the avatars, it is possible to access metaverse malls, personalized according to huge amount of data defining user's preferences. The shopping experience is transformed into a truly immersive experience. The continuous digital interactions, help the brand to easily access data, which allows knowing more and more in details users. This allows brand to deploy a segmentation of one strategy. This reality witnesses a strong reduction of production volumes, since fashion is transferred in the virtual reality, and the factories still operating exploit an Industry 4.0 paradigm with a high level of automation.

6. SCENARIO 2: ENDLESS CARING

In the second scenario, the fight against climate change has reached a turning point since there has been a serious and shared commitment after the climate crisis had become too frequent and severe. Already after the pandemic, which has made it even more evident how much the climate impact is fault of man's activities, something changed among people. A new personality has emerged prominently, the Carers. They are originally moved by a great sense of shame and consequently are willing to change their daily activities to embrace a more environmental-friendly lifestyle. Fashion, being one of the worst performers in terms of environmental sustainability, has been put under close supervision. Fashion players have understood the need for a transformation in response to the pressures and demands of this new personality. Consequently, the linear model leaves room to circular models and the value chain restructures itself to chase waste creation and embrace an endlessly circular model. From its origin, a fashion item is designed to have an infinite life cycle, by using more durable and sustainable materials, or to ease the disassembly process. The sense of responsibility emerged by Carers, has also affected fashion players, which establish durable and trustworthy collaborations to share best practices and set industry standards for product design. Brands particularly are adapting their businesses models to embrace circularity, introducing remanufacturing, rental, and repairing. Community of Carers are arising, as a collective assumption of responsibility, to share tips and contents on how to extend product life, for example with repurposing activities. A paradigm shift in product value has come true, since value is not what is new and fashionable, but rather it is narrative behind the garment, which makes it worth to care of it.

7. SCENARIO 3: FASHION ACTIVISM

The third scenario witnesses a world with deep social scars that are gradually healing. For decades social disparities have widened continuously, from wealth distribution, to access to primary services and goods. Social tension has continued to rise but with the Covid-19 pandemic something has change. We have witnessed the awakening of social consciousness and of an attitude of criticism. A personality has emerged particularly: the Activists. They are characterized by a strong resentment and are ready to raise their voices against the inequalities present in the world. The fashion industry, being among the least sustainable from a social point of view, has undergone radical transformations. In fact, the old model of global value chains, characterized by a paramount difficulty in controlling the various phases and by a complete lack of transparency, is no longer acceptable and accepted by society. People are demanding a repurposing of business, which implies abandoning the logic of profit to embrace a broader and more ethical perspective. The answer to this is the onshoring of the supply chain, with the concentration of activities and suppliers in one single territory. This facilitates control and respect for workers, with fairer wages and working conditions. This new model also leads to combat workaholism, by the revaluation of one's life, leisure, and values. Local production also leads to a change in the fashion product and brands, which become representative of a certain territory, its culture and fighting for its peculiar issues. Fashion has become an instrument of identification, of belonging to a movement, to ideals. Thanks to the application of new technologies such as blockchain, all the actors involved have the possibility to access trusted information over the origin of a garment and all the stages of production, with particular attention to workers conditions. Thanks to this technology, it is possible to sell even outside of the regional borders without harming the reliability of product information.

8. OUTPUTS

As introduced in the methodological part, the function of the three scenarios was to present three different realities that differed from each other and in which some aspects of them were taken to the extreme. In the first scenario there are solely digital products and users value the experience provided by the brand. In the second one, the product is physical, and the value of a garment is not given by its newness, but by the narrative behind it. In the third scenario, each product is made with the purpose of helping the community and the territory in which it was produced. From the value chain point of view, Digital Immersion is the most disruptive as the value chain is totally virtualized, and many steps are no longer necessary. In Endless Caring, supply chains move closer following a nearshoring logic but the main disruption is converting raw material producers into recyclers. Fashion Activism implies that the value chain is relocated to a local dimension, which means disrupting completely the current global model. Since the goal of our research work is to propose a feasible transition towards a new paradigm, a preferred scenario was to be chosen. We therefore tried to evaluate the possible impacts of the three scenarios. However, the scenarios are moving into the future and in a reality that change dramatically. All these makes it extremely difficult to quantify these impacts. We have chosen to use in this validation phase the Sustainable Development Goals developed by the United Nations, since they constitute a collective and shared language and a clear direction to be followed by all nations and all businesses. From the business perspective, adopting SDGs is also beneficial, since they would be more likely aligned with policies emerging in the future. We chose three SDG, according to their applicability to our scope of analysis:

- SDG 8 *"promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work"*
- *SDG 12 aim to "ensure sustainable consumption and production patterns"*
- *SDG 13 discusses climate action and, in particular, cites "Take urgent action to combat climate change and its impacts". All these thoughts 3 targets (UN,2015)*

The first SDG refers to decent work, and therefore the control of child labor and decent working conditions. These issues are particularly relevant to the initial stages of the value chain, namely those that include fiber production, fabric production, and textile production, where there is often exploitation of workers and conditions of modern slavery. SDG 12 refers both to the production phase of brands, where it also focuses on a more efficient production system with less waste, and to the final phase, and especially the relationship with customers. Raising consumer awareness and promoting consumer education to improve their willingness to engage in sustainable consumption. Finally, Goal 13 takes into consideration the environmental aspect. Since fashion is an extremely polluting industry in all its activities, this SDG allows us to consider the impacts along the entire value chain.
Then we considered all the targets for each SDG and evaluate the consistency of our scenarios with the realization of each target:
Rate 0, if the scenario does not consider the target
Rate 1, if the scenario only considers the target
Rate 2, if the scenario moves towards the target
Rate 3, if the scenario achieves the target

For SDG 8 it is Scenario 3 that has the greatest impacts, since this scenario focuses on the social aspect, respect of working conditions and control over the behaviors of suppliers. It is followed by Scenario 2, where brands play the role of accelerators, especially for MSMEs. The last is Scenario 1 that offer only a virtual and more inclusive access to education.

For SDG 12 it is Scenario 2 that has the greatest impacts. This scenario is based on circular business model that improve the resource efficiency in all operations and reduce waste. Scenario 3 achieve some targets thanks to the wider purpose of companies. Scenario 1 impacts due to the drastic reduction of production and the pollution related.

For SDG 13, Scenario 2 outperform the other scenarios, investing in environmental protection, engaging in climate policies and educating on climate change mitigation. It is the only one to achieve all the three targets, whereas Scenario 3 only moves in these directions thanks to localism, which stimulate collaboration with governments. Scenario 1 is instead dominated since it only takes into consideration these targets.

With this output analysis performed, we wanted to get a clearer view on strengths and weaknesses of the three scenarios, in terms of sustainability enhancement of the fashion industry. Our final choice has fallen on the second scenario: Endless Caring. Indeed, the compatibility of this scenario with Sustainable Development Goals is promising. SDG 12, “ensure sustainable consumption and production patterns” and SDG 13, “take urgent action to combat climate change and its impacts”, are significantly achieved by Endless Caring scenario since it is the only scenario that considers all the targets of which these two SDGs are composed of. As regards SDG 8, “promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all”, only the Fashion Activism scenario outperform Endless Caring, since it is focused on the social issues. Though, from a comprehensive perspective Endless Caring is the most promising scenario. If we look at the difficulties of realizing full potentiality of scenarios, Endless Caring is the least disruptive both from a value chain point of view, which remains global and similar to the current situation and from a product point of view, which continues to be physical. Endless Caring also mitigates the negative impacts on workers, since the disrupted jobs can be more easily reallocated in the new value chain, avoiding the resistance of workers to this transition. Finally, from a technological standpoint, this scenario leverage on technologies which have almost reached their maturity.

PART III – PAVING THE PATHWAY

This third and last part aims at translating the first two parts into valuable resources for companies operating in the fashion industry. Two are the chapters composing this section: *Guide for a Transition*, which through the backcasting methodology designs a transition pathway from 2021 to 2030, and *Conclusions*, which summarizes the findings, limitations as well as some further studies suggestions.

Fig. ES 4 – Transition Pathway, key steps to be achieved for each phase

9. GUIDE FOR A TRANSITION

In the previous chapter we conducted an extensive digression to determine our preferred future, which turned out to be Endless Caring. Once identified the preferred future, we could pass to the successive phase that is the backcasting. The basic idea of this process is to project back long-term visions of desired futures until the present and create a transition pathway in which projects become steps in this transition. To aid in the transition, three distinct phases have been identified in which incremental actions must be taken in the direction of people, value chain and brand evolution, which are the same dimensions considered during scenario creation. The first phase encountered is the *Education phase*, which must be implemented by 2022. This initial phase focuses on educating stakeholders and raising awareness about the unsustainability of the current fashion model. Then, the *Activation phase*, to be realized by 2025, in which the industry begins to take its first steps towards a circular model, and users actively participate in this transformation. Finally, the *Conversion phase,* which achieves a 100% circular business models adoption by 2030. For each phase, we provided a map with the main steps that need to be implemented at the three levels of analysis, and then some considerations on how each phase contribute to the transition progress, using SDG and describing qualitatively the progressions of the main cycles introduced by our model: repairing, repurposing, repairing, remanufacturing, recycling, and recovery. Particularly, for the second and third phases we developed an additional map to help track the progresses from now until the due date. This map defines some metrics for each key step, and also some main goals which would help to synthetically measure the progress of persona, value chain and brand in a mid- and long-term view. For this part being the main findings of our work, Fig. ES 4, ES 5 and ES 6 report the transition pathway steps, the key metrics to measure the progress and some main synthetic goals to be achieded in the medium and long term.

Fig. ES 5 – Phase 2 2025 Metrics and Key Goals

2025

Mid-term Metrics & Key Goals

Fig. ES 6 – Phase 3 2030 Metrics and Key Goals

2030

Mid-term Metrics & Key Goals

10. CONCLUSIONS

Today's world is shaken by extreme tensions, both of a social nature, due to increasing inequality, and to climate change issues, where decades-long neglect of climate change and exploitation of natural resources have devastated our planet. In 2019, the outbreak of the Covid-19 pandemic, brought even more drastic impacts. the pandemic crisis has exasperated even more the structural inequalities and deep discriminations that constitute our society, globally, regionally, and locally. This led to the awakening of social consciousness, particularly among the younger generations of Millennials and Gen Z. Consequently, they expect companies to take a stand and demonstrate with facts their commitment. The impetus brought by Covid-19 along with the growing pressures from the younger generations is an opportunity that must not be wasted to transform businesses and respond to a deep sense of purpose. People demand an abandonment of profit as the dominant logic to embrace a broader and more ethical perspective on the role that business play in our society. Global value chains, that have been the dominant model for decades, are not accepted anymore. In accordance with these trends, we have witnessed the explosion of B-corps as well as the accelerating adoption of nearshoring strategies. We can say that is the right time for undergoing a major transition and we, as management engineering students, with a foot in the working environment, want to gift our contribution. With our thesis, we contribute to identifying and understanding how to make the most of this change that is taking place, and in particular we have chosen to focus on the fashion industry. We are passionate about fashion because of its power to shape our society, values, and habits is fascinating and is one of the reasons we decided to study this industry. It is a transformative force that molds our world by acting on a blurred boundary between art and cultural heritage, revising continuously traditions with fresh ideas. Despite its innate innovative drive, the actual industry organization shows numerous and harsh unbalances, both from an ethical and environmental point of view. In fact, fashion has broken its pure artistic soul, becoming in recent years synonymous with consumerism; one of the causes has been the affirmation of the fast fashion model. Globally distributed supply chains exploit unethically the unbalances of our world, producing many negative externalities, especially for workers in the early stages of the value chain, and widening more and more the existing social gaps, rather than fighting them. Covid-19 showed the weaknesses and inequalities of the current system and triggered a social awakening in the population. All of this has increased the pressure on companies that need radical change in order to better face the future. We gave our contribution by envisioning future perspectives and a transition pathway that could concretely lead fashion companies out of the tremendous actual situation. Among the three scenarios identified, *Digital Immersion, Endless Caring* and *Fashion Activism*, our prederred future is Endless Caring. Indeed, the compatibility of this scenario with Sustainable Development Goals is promising, it is the least disruptive in terms of value chain, and mitigates the negative impacts on workers, avoiding in this way workers and incumbents resistance. To support the transition, three distinct phases have been identified in which incremental actions must be performed in the person, value chain and brand categories, which are the same as those that were used to develop the scenarios. The first phase is the *Education* phase, which must be implemented by 2022, and focuses on raising awareness around problems and propose the Endless Caring paradigm. The second phase is the *Activation* phase that must be implemented by 2025, which activate the immediate steps and enable the development of more complex ones. The last phase is the *Conversion* phase to be implemented by 2030, where the full potentiality of Endless Caring realized. To synthetize the Endless Caring paradigm, we can describe its main feature, circularity. User-User cycle includes the Resale and Repurposing activities, which happen among users. User-Brand cycle, with the Remanufacturing and Repairing processes, and finally User-Recycler, where we find Recycle and Recovery. The cycles that from the earliest stage of the transition already manage to grow exponentially, are resale and repair. The first one is a service that is already rapidly expanding today. However, it has not yet reached its full potential due to a reverse logistic that has not yet reached full efficiency and the low availability and accessibility. Repair phase has already begun to take off, especially for the ease of adoption and the impact it has on customer retention. Since the education phase, this offering is being integrated by many brands into their services.

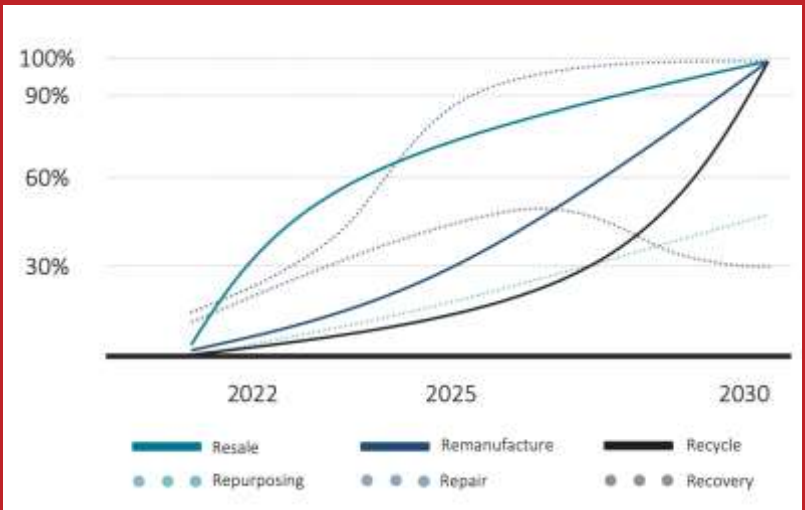


Fig. ES 7: Cycles progression along the transition

This phase will have a slight increase also in the successive phases thanks to the repairing kit provided by the brands progressively in the moment of the purchase. The other cycles, on the other hand, considerably increase their use after the activation phase. If we consider Remanufacting as an example, it will face initial difficulty in spreading, because of the absence of production standards and therefore each product is assembled and undergo different treatments. In the second phase we begin to see the first collections of these products, but it is in the next phase that they reach their full potential, with growing exponentially driven by customer demand. In fact, customers are no longer looking for novelty in garments, but rather for the story behind them, with entire product lines dedicated to remanufactured products. As for recycling, similarly to the case of remanufacturing, the initial difficulties are due to the vast number of different products that have undergone different processes and are therefore difficult to recycle. It is in the last phase that it reaches its full development thanks to the development and implementation of Design for Recyclability principles. Moreover, customers know how to recycle products, and help in the initial stages by removing parts that cannot be recycled, such as hinges. In addition, all products could be equipped with RFID technologies, to facilitate identification and sorting. The repurposing cycle develops after the second phase, thanks to the presence community of carers that helps the repurposing activities.

However, this phase does not get its total development, because there are many alternative cycles, and the repurposing phase remains more like a recreational activity. Different from all the other phases is the Recovery phase, which reaches a peak in the acceptance phase and then decreases in the following phases. The initial growth can be attributed to open-loop activities to the materials that were already in use and to the improvements made in the collection of garments activity increase the volume of products that cannot be recycled and that participate in this cycle. The recovery, having reached its peak in the previous phase, begins a downward trend. The products that enter this cycle are those that were manufactured before the education phase. All newly produced garments are made to be either totally recyclable or totally biodegradable and therefore this phase decreases its relevance.

Notwithstanding our attempt to provide contributions for theory and practice, we are aware of the limitations of our study. We have adopted an interdisciplinary approach, integrating our Engineering background with that of Design. This led to an increase in the complexity of this thesis, also because for the first time we were dealing with such a large project, and with this kind of methodology. Accordingly to the methodology, we did not collect first-hand data, which would be very difficult to collect so that they were very meaningful. However, in the following phase of validation of the results obtained, a first-hand data approach would have been valuable, such as with focus group or Delphi method, to verify the results obtained with a panel of experts of the industry. Moreover, given the subjective nature of our work, anyone who approaches this methodology, can collect signals and make considerations that may lead to different perspectives from ours. Nevertheless, different visions that may arise in the future would not demolish our contribution, but rather would enrich the dialogue around future of fashion, which is exactly the right approach of future studies. As for the future studies, we expect further works on this same topic, that will enlarge the dialogue on future fashion. Indeed, the process we followed itself is highly iterative since along the transition reigniting the process would mean apply corrections and perfection the outputs. Interest dimensions of future analysis could be about the evolution of technologies that enable Endless Caring cycles and the response of people along the transition phases.

INTRODUCTION

> *In these troubled, uncertain times, we don't need more command and control.*
> *We need better means to engage everyone's intelligence in solving challenges and crises as they arise.*
>
> *Margaret J. Wheatley*

If one world could summarize the era we are living in, it surely would be *uncertainty*. Indeed, the beginning of the 20th century has marked a radical change after decades of economic boom, where confidence in human capabilities and progress drove enthusiasm, at least in the most developed countries. Climate change has revealed itself harshly, with cataclysmic events frequency increasing at a terrifying rate. 2008 economic crisis undermined the foundations of our confidence in the financial systems. Political scandals have compromised trust in the political system, enlarging the perceived power gap between citizens and leaders. The leading class is under close watch since digital technologies have broken barriers to information accessibility and people demand more and more facts, rather than promises and commitments. Within this framework, in 2020 Covid-19 pandemic disrupted our lives and blocked the whole socioeconomic system for a long period. It has brought to light some issues of our system, namely the low resilience of sanitary systems as well as of industrial supply chains. It has shown that by reducing human activities, the level of pollution radically decreases. It has demonstrated that our society is fundamentally stretched by huge social gaps, which do not only apply to the individual dimension but to whole countries. The purchasing and distribution of vaccines is a quite thought-provoking dynamic in this sense. Nevertheless, the traumatic experience we have lived is bringing some major consequences that will be fully seen only in the future to come.

In this context, fashion reportedly is known as an extremely un-sustainable industry and only recently players have started to focus their efforts to fight these themes. We simply cannot accept that fashion is perceived in this way, because we love what it represents as a cultural intensive industry. Fashion is a wonderful representation of people and of our society; it follows their evolution along time and often it is fashion to drive societal evolution. We cannot stand that a garment is *consumed* as a it was a food or a stock of energy. Fashion address some complex needs of people that go well beyond the necessity of covering oneself to protect from outer environment. It is a mean to express emotions, feelings, as well as our status. Along life, people change their way of dressing, marking the passage of time from childhood to adulthood to senility. Fashion can move people, instill feelings, and even drive a protest. Nevertheless, today's fashion is far from this idealistic representation. It is associated with consumerism, exploitation of planetary resources and people, cultural appropriation. This is not a problem of perception, but rather it is the status quo of the industry. The question is then how to transform this industry? How could we make fashion sustainable? The goal of our research is to answer these questions, since we want to give our contribution to a sustainable transition that would affect fashion, but also the whole planet. Indeed, the relevance of fashion industry impacts is so high, that a successful sustainable transition would be strongly beneficial for our Earth. We join the choir of all the young people in the world that are vigorously demanding *change*. We are worried about our future perspectives, but we do not want to sit back, and with our research we hope to provide meaningful indications for a successful sustainable transition.

To do so, we will be through a long journey, that starts from the present (late 2021) and reach a 10 year far future. We will see how fashion could become in 2030, after it adopted a totally new paradigm. Finally, we will get backward until today, so that we can understand which transition would be needed to make that future a reality. We would like to clarify from the very beginning, that this is not a forecasting work. We are not aiming at a precise prediction of what is going to happen in the future, but rather we will envision a preferred future, with the objective to drive future evolution. We will still use the term *foresight*, though with the meaning just introduced.

This dossier is articulated in three parts, each representing a step of our journey.
PART I - Interpreting the present contains a thorough literature review of the current topics of interest, as well as research on the methodological background.
PART II - Envisioning the Future consists of the foresight work itself, providing to readers a real immersion in 2030 scenarios of fashion.
PART III – Paving the Pathway designs an actual transition from 2021 to 2030, identifying the core steps and goals to be achieved for making this transition a real succe

PART I

INTERPRETING THE PRESENT

PART I

LITERATURE REVIEW

1.

CHAPTER 1

2020 FASHION SCENARIO

We chose fashion because it is a lense to interpret people and our society, because it has the power to transform our world and future, and finally because it is a wide and complex industrial system, which though has extensive margins for improvement.
In this first chapter, we introduce the global fashion industry taking a pre-pandemic perspective. This is to describe an unbiased scenario and remark those long-lasting changes that were already happening within our society before the pandemic outbreak. At first, we take an even wider look at our society, observing how it is fueled with tensions and uncertainties for the future. Inevitably, the socio-economic system is affected, and fashion industry is no exception. Despite this tense scenario, fashion companies can understand the evolution of our society and drive the evolution of mankind.
Fashion industry is surely globalized, still there are significant unbalances in terms of markets relevance. Emerging Asia Pacific and emerging Europe are progressively rebalancing sales distribution, as well as Russia, Middle East, Latin America, and Africa, who are though experiences more economic and political challenges, likely to dampen consumer spending.
Sectors within the fashion industry are also showing signs of umbalances, with middle-field positioning more and more under pressure from both value and luxury. Middle-ground positioning is a very risky strategy that may hamper survival, since people may not perceive the uniqueness of a brand identity.
Despite the large number of firms operating in the industry, only few own great market power and drive the whole industry results, a phenomenon called industry polarization. Comparing the geographical areas, fashion industry is nearly a monopolistic market, with Europe and North America seizing most of the value generated.
To conclude this first chapter we focus on Italy, given the relevance of Italian fashion both from a global and national perspective. The most effective positioning for Italian companies is high-quality and crafted products because of their appreciation abroad. Moreover, the district organization of Italian manufacturing system, made of smaller size companies, enable flexibility and an attituted for innovation.

KEY FINDINGS

1- + 2,5% average sales growth fashion industry from 2009 to 2020 (pre-pandemic) but trend is negative

2- China has contributed to 38% of fashion industry growth in the in the last 10 years

3- Mid-market contribution to industry economic profit in the period 2010 – 2020 decreased from 59% to 39%. Whereas in the same period luxury contribution has grown from 21% to 36%

4- The top quintile of companies contributed to more than 200% to total value generated while the bottom 20% accounted for -95%

5- Around 90% of overall sales are seized by European and North American companies

6- Average size of Italian fashion companies is smaller compared to the industry and are organized in districts

1.1. WHY FASHION?

"What you wear is how you present yourself to the world, especially today when human contacts are so quick. Fashion is instant language." —Miuccia Prada

"Fashion is the armor to survive the reality of everyday life." —Bill Cunningham

From the beginning of time, men and fashion have always been connected, and their bond has been continuously evolving over centuries. From the primary need of repairing bodies by exogenous factors, men have progressively charged more and more meanings to dressing due to the point that observing fashion over different ages or places, allows us to understand our society, spot the main trends, beliefs, values simply by observing clothes and how people wear them. We are so passionate about fashion because it has the power of communicating our emotions to the outside world through the choice of designs, colors, symbols, materials. We can express self-identification by adopting subculture uniforms, we can show appreciation or indignation for a cause, we can yell our independence or frustration, we can convey our love or respect. On the other hand, fashion helps us understand and describe our feelings. Changing our clothes means changing how we perceive ourselves, our mood, and our spirits. How much time do we spend in front of a mirror to make sure we look like we desire? Even in case you are not that obsessed with appearance, we bet that any almost reflecting surface is good for a quick check, for example in the elevator, on your car, the glass door of a restaurant.

This power that fashion has to shape our society, values, and habits is fascinating and is one of the reasons we decided to study this industry. Fashion stands as the mirror of our society, it is the narratives of our costumes and beliefs, it communicates ideas, takes sides on social and political issues, and breaks the settled schemes continuously. It is a transformative force that molds our world by acting on a blurred boundary between art and cultural heritage, revising continuously traditions with fresh ideas. Besides its transformative power, the fashion industry, with its global value chains made of numerous processes and large networks of economic agents, is a complex system with extensive margins for improvements. Despite its innate innovative drive, the actual industry organization shows numerous and harsh unbalances, both from an ethical and environmental point of view. Likely, we can detect signals of a major change in action that will reframe not only the value chains but also our perception of fashion and its role within society. There is a huge challenge underway, a shift of paradigms and Italy can play a leading role, boosting responsible innovation by leveraging on its unique balance of competencies and heritage (Rinaldi, 2019).

1.2. UNCERTAINTIES THROUGHOUT THE WORLD

Before going into the specificity of the fashion industry we would like to introduce a quick and wide perspective on the global uncertainty we are currently living in. Indeed, a complex set of events and factors are putting increasing pressure on our society and affecting various industries' performance. The first factor to consider is the influence of the main economic institutions. Indeed, after a period of accommodating monetary policies, the US Federal Reserve has begun to raise interest rates, and the European Central Bank is considering monetary policies that may cause a reduction in global growth. Forecasts conducted by the World Bank, International Monetary Fund, and Organization for Economic Co-operation and Development (OECD) have been predicting a slowdown in growth in the developed markets and flattening of the growth curve in developing markets already in 2019 (McKinsey 2019). In addition, the global society is showing increasing political and geopolitical instability. For instance, according to research conducted by the Bank of England, Brexit has fueled this scenario of uncertainty and consequently reduced capital spending by about 11%, and that will certainly have impacts on UK-EU flows of goods and capitals (Thomas, 2019). The trade war between the USA and China led to billion dollars tariffs imposed on importations and compromised relationships between the two major powers. The International Monetary Fund stated in July that reducing trade tensions and resolving uncertainty around trade agreements is a vital part of putting global growth on a stronger footing (IMF, 2019). The overall numbers are bleak: World Trade Organization more than halved its global trade volume growth forecast for 2019 to 1.2 percent and warned that the 2.7 percent growth predicted for 2020 was still dependent on a return to "more normal trade relations" (BBC, 2019). Additionally, a major issue in the debate over migratory flows from Central and South America, which arose especially after the Trump administration has been stress-testing the citizens' tolerance for extreme border enforcement.

Those policies have drawn considerable public attention and protest not only in the countries involved and have become a focus for political conflict (Taub et Al. 2018). Asia and Latin America are fields for political upheavals too (McKinsey, 2020). In Asia, one of the most notorious events is that of the demonstrations in Hong Kong, following the introduction in March 2019 of a law that would have allowed forced extradition to China. Citizens reacted in mass, by protesting and taking to the streets in a way that had never been seen before. The first demonstration took place on March 31 with a participation of 12,000 protesters and then gained momentum to reach over 240,000, even though organizers claim a million participants (Kleefeld, 2019). Protests outside government headquarters turned into violent clashes and accusations of police brutality have strained the relationship between protesters, the press, and the police (Solomon, 2019). Although the extradition bill was withdrawn, protests in Hong Kong continued for months as the movement made a much broader demand for change. If we focus on Latin America, we can see that many countries are a stage for violent protests. A clear example is Bolivia, where, following the announcement of possible re-election of the presidency of Evo Morales, there have been clashes between opposing factions (Amnesty International, 2020). Venezuela was shocked by violent repression against opponents of President Maduro, after Juan Guaidó, proclaimed himself interim president with the support of the U.S., Canada, and many South American states, including Brazil and Colombia (Rai News, 2019). Security forces sent by Maduro have resulted in the deaths of at least 47 people killed in gunfire (Il Post, 2019).

Today's society is fueled with tensions and uncertainty for the future which inevitably reflects on the socio-economic system and on the fashion industry performance. Fashion companies need to understand the evolution of our society to anticipate and drive evolution of mankind.

And again Haiti, which had never really recovered from the 2010 earthquake which caused thousands of deaths and injured. Haiti was already facing multiple crises, including growing political instability, gang-related violence, civil unrest, and rising food insecurity and malnutrition (Albero Della Vita 2019). With these initial words, we want to stress how today's society is fueled with tensions and uncertainty for the future which inevitably reflects on the socio-economic system and also on the fashion industry performance. Despite this unpromising scenario though, fashion companies, being cultural intensive players, need to understand deeply the evolution of our society to anticipate and drive the evolution of mankind.

1.3. REBALANCING FASHION MARKETS

The first macro data from which we want to build on some reasoning is the growth of the industry. Since the financial crisis of 2009, the fashion industry has managed to score an average sales growth of 2.5% per year. However, this growth seems to be slowing down in the last few years, independently by 2020 pandemic-related events, and this is mainly due to the contingent and globally diffused state of uncertainty and tension previously introduced. McKinsey estimated before the pandemic that growth in 2020 would have been lower than in 2019, with a value of 3.0/4.0 compared to 3.5/4.5 (Fig. 1, McKinsey, 2020). Additional information is on how the various markets are performing. Mature Europe and North America growth rates were predicted to be respectively 2-3% and 1-2%, proving to be the most mature markets (Fig. 1, McKinsey, 2020) and consequently the biggest in size. Indeed, European and North American companies, which collectively contribute to a relevant portion of the whole industry sales, have as primary market the domestic one, 42% and 67% respectively (Fig. 2, Area Studi Mediobanca, 2021). On the other hand, we can see that emerging Asia Pacific and emerging Europe are progressively rebalancing the sales distribution. However, it is expected that over time, emerging Asia will continue to prosper, while emerging Europe may experience a slowdown in its growth. Latin America, the Middle East, Africa, and Russia are experiencing more economic and political challenges, that are likely to dampen their consumer spending (Fig. 1, McKinsey 2020). The

Fig. 1 - Sales Growth breakdown for geographical areas.
Source: McKinsey et Al. 2020

Asian market is still dominated by *China*, which for over 10 years accounted for 38% of global fashion industry growth across segments, and particularly in the luxury sector, where since 2012 it has grown an impressive 70%, with brands such as LVMH and Gucci present since the 1990s (McKinsey, 2020). Not only luxury players are strongly interested in the Chinese market; more and more mass-market players have also prioritized China as a core part of their business strategy. For example, Inditex is present in the territory with more than 600 stores (Inditex, 2018), while H&M owes 5% of its global revenues to the Chinese market (H&M, 2018). Although China is the main actual force in the Asian landscape, the emerging countries of that region have been performing the best growth and offer most opportunities in the years to come. Suffice it to say that *Indonesia* is the fourth largest country in the world by population, with nearly 270 million people (The World Bank), and *Vietnam* and the *Philippines* are seeing rapid GDP growth (The World Bank; Graph 1). Furthermore, these are countries driven by young and digitally sophisticated consumers, with 40% of the population that is under the age of 25, compared with 28% in China and 30% in the US (United Nation, 2019). Internet penetration is at 63%, compared with 57% in China, and social media use is growing fast; the number of social media users in the region grew from 360 million to 402 million in just a year (Hootsuite, 2019). This market of young consumers are highly confident with digital solutions, paving the way for the entrance of new brands in the country, which can experiment with digital channels sooner than physical ones, but also for the expansion of already established brands into the new digital market. Not least, an the emerging middle class is experiencing rising levels of disposable income and developing a taste for fashion brands away from the informal market; it is this demographic that is set to drive growth in the region's $ 50 billion apparel sector, across the six core markets: Vietnam, the Philippines, Indonesia, Malaysia, Thailand, and Singapore (McKinsey, 2020).

Emerging Asia Pacific and emerging Europe are progressively rebalancing the global fashion sales distribution.

Russia's clothing market is worth close to $30 billion annually and it is the ninth-largest in the world, according to data from McKinsey FashionScope. FashionScope is the apparel-specific view developed by McKinsey, which organizes granular data and statistical forecasting across midmarket and luxury price points (Remy et Al. 2015). Despite the recent economic slowdown in the country, the luxury market is showing new signs of stabilization. In 2018, luxury brands reported their highest revenues in at least four years, including Chanel, Dior, Tiffany & Co, and Bulgari (Oreanda, 2019). This happened because Russian's luxury consumers have been spending more at the domestic market, but also the depreciating ruble has made Russia more attractive for fashion-seeking tourists; particularly Chinese tourists were up almost 25% in the first half of 2019 from the previous year and are expected to spend more than $1.1 billion in total this year (Russia Business Today, 2019). Russia also offers increasing opportunities for price-competitive players, especially thanks to an increasingly budget-conscious middle class (McKinsey, 2020). The third opportunity in Russia stems from the strong growth and dynamism of e-commerce. Internet penetration in Russia is high and Russians spend an average of 6.5 hours a day on the internet (Bell, 2019). In 2018, online sales accounted for more than 10 percent of all apparel sales in the market, which represents double the 5 percent share seen just five years prior (Euromonitor, 2019) and grew at an impressive 26% year-on-year in the first half of 2019 (The Moscow Times, 2019).

India deserves special attention since it is still projected to be the fastest-growing major economy, according to the IMF (IMF, 2019). The Indian clothing market will be worth $53.7 billion in 2020, making it become the sixth-largest globally and comparable to the UK ($65 billion) and Germany ($63.1 billion), according to data from McKinsey's FashionScope. The Indian middle class is forecast to expand at 19.4% a year over the same period, outpacing China, Mexico, and Brazil (Economist Intelligence Unit, 2019). The growth in the apparel sector is also being driven by increasing tech-savviness among consumers. The country in ten years has gone from having 5 million smartphones and 45 million people who had access to the internet, to 355 million and 460 million respectively, and estimates predict that by 2021 it could reach 900 million Indian consumers online (Wu, 2017) (Hootsuite, 2018). Social media use is expanding at around 25% annually, with nearly 70% of users active on Instagram. Obviously, this will lead to an increase in e-commerce retailing which has already accounted for nearly 11% of the whole apparel market in 2018, doubling the proportion of just three years prior (Pinnock, 2018). Fashion firms have few alternatives to catch this opportunity, depending on the knowledge of local dynamics. Firstly, players can partner with existing e-commerce platforms, the most suitable strategy for players with little brand awareness and with relatively low capital to invest, to test demand and customer preferences. Secondly, brands that have little local knowledge and are looking for fast entry can enter with a franchise model, building brick and mortar retail.

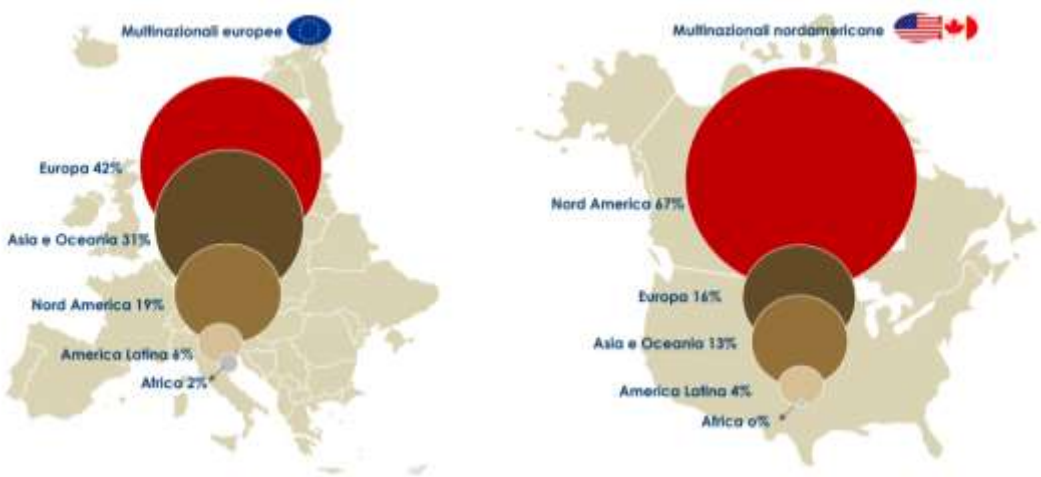


Fig. 2 – Sales distribution for geographical areas, European and North American companies. Source: Area Studio Mediobanca, 2021.

Finally, players that have significant local knowledge and capital resources can create fully owned and operated stores (McKinsey, 2019). In Latin America, *Brazil* deserves a special mention, being the sixth most populous country in the world and subject to stable growth in recent years (The World Bank, 2020). More and more brands are thinking of entering this country even if, they have to overcome a major challenge, tariffs: indeed, Brazil has 23.3% tariffs for textiles, according to the World Trade Organization (World Trade Organization, 2019). Finally, *The Middle East* still has potential, despite being a well-established fashion market with strong mall culture. While the Gulf countries are far smaller than China in terms of population size, the propensity of its shoppers to spend big is what gives the region an outsized role among international markets. In fact, the average consumer in the UAE and Saudi Arabia respectively spends over 6 times and 2 times as much on fashion as the average consumer in China. Annual fashion sales in the Gulf Cooperation Council (GCC) markets amount to $ 50 billion, reflecting the region's significant financial clout. Spending in some GCC countries is among the highest globally on a per capita basis, reaching approximately $500 and $ 1,600 per person in Saudi Arabia and the United Arab Emirates (UAE) respectively. Dubai is the region's shopping capital, but other markets are maturing fast, with Saudi Arabia taking a place at the top table. The model in the Middle East is different given historical restrictions on foreign ownership: international fashion players habitually partner with established local players (McKinsey 2020). Partnerships will continue to play an important role in the form of franchise relationships, joint ventures, or, in some cases, distribution-only relationships, with local family-owned businesses including Alhokair, Alshaya, Al Tayer, Azadea, Chalhoub, Saudi Jawahir Trading, and Rubaiyat.

Emerging Asia will continue to prosper, while emerging Europe may experience a slowdown in its growth. Latin America, Middle East, Africa, and Russia are experiencing more economic and political challenges, likely to dampen their consumer spending.

Middle Eastern consumers are also becoming increasingly connected, with internet penetration in the UAE and Saudi Arabia at 99 and 89% respectively, compared to just 57% in China (Hootsuite et We are Social, 2019). E-commerce, therefore, is fast becoming a table stake in the region. It is set to grow at around 40% a year over the next five years, increasing its penetration to 9% from the current 2%. In some fashion categories in Saudi, internet platforms are thriving, and international digital players including Yoox Net-a-Porter, Farfetch, Jollychic, and Amazon are already wooing the local consumers. Local players too, both omnichannel and pure physical players like Ounass, The Modist, and Namshi have sprung up to capitalize on this trend. (McKinsey, 2020). However, the country begins to present some difficulties, mainly due to the slowdown in economic growth caused by oil prices, which decreased by about 35% compared to 2010-2014. Additionally, increasing labor costs due to new visas and administrative fees, and reduced energy subsidies, are putting more and more and resulted already in business closures during the recent years, especially in the wholesale and retail sectors (McKinsey, 2020).

1.4. THERE IS NO MIDDLE GROUND

The fashion industry includes a huge amount of product categories with a variety of offerings; to map this complexity, we can refer to three main segments:

- *Luxury & Affordable Luxury*
- *Premium & Midmarket*
- *Value & Discount*

Clearly defining these segments is often difficult, but we would like to list some unique characteristics that may help readers differentiate one from the others. Starting from *luxury*, Sozzani in Vogue magazine described it as "the high-quality and creative ready-to-wear and it is, of course, from a business and brand placement point of view, addressed to a high consumer range. Craftsmanship is luxury … when it is handmade, tailored for few … meaning exclusiveness" (Sozzani, 2011). Similarly, *affordable luxury* items can be understood as those products perceived to be of superior quality which elevates the owner's socioeconomic status and cost slightly more than necessities (Huddleston et Al. 2017). People might turn to "affordable luxury" items to fulfill this desire for luxury products or as an initial gateway into higher-end products (Mundel, 2021). *Value* and *discount* segments are positioned in the lower-price range and are often characterized by large production volumes and an extremely fast time to market; players can exploit successful designs already in the market by bringing them into their stores at lower prices. Reduced prices are achieved through large production volumes and production processes that often come from low-cost labor countries (Berg et Al. 2018).

Premium, and *mid-market*, are the intermediate sectors between the previous ones, offering a better product and material quality than the value segments but keeping lower prices than the higher-end segments. Fig. 3 helps us understand the relative power of the value segments in terms of growth rates. Upper and lower-end segments performed better, with growth rates around 4%, 5% even 6%, whereas midmarket and premium have been struggling more, with decreasing growth rated, estimated for 2020 among 1,5% and 3% (Fig. 3, McKinsey 2020). Fig. 4 shows instead of the absolute values of the luxury market from Altagamma 2021; after a transitory contraction linked to the 2008 financial crisis, has reported an annual growth rate of 5%. This relevant growth has been dragged above all by the extraordinary development of the Chinese market, which is estimated to represent around 35% of the whole luxury segment market; travel retail plays a key role since it accounts for around 10% of the companies' turnover (EY et Al.2020).

Fig. 3 - Sales Growth breakdown for geographical areas, and segments. Source: McKinsey et Al. 2020

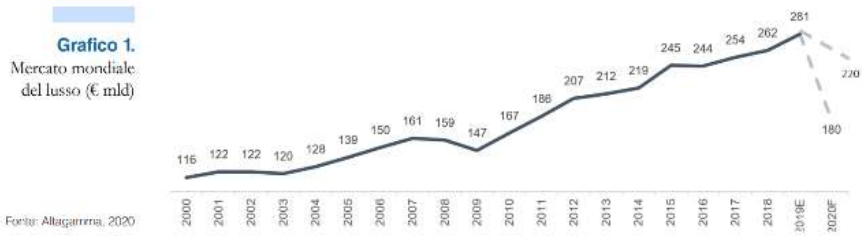


Fig. 4 - Absolute values of global Luxury Market. Source: Altagamma, 2020

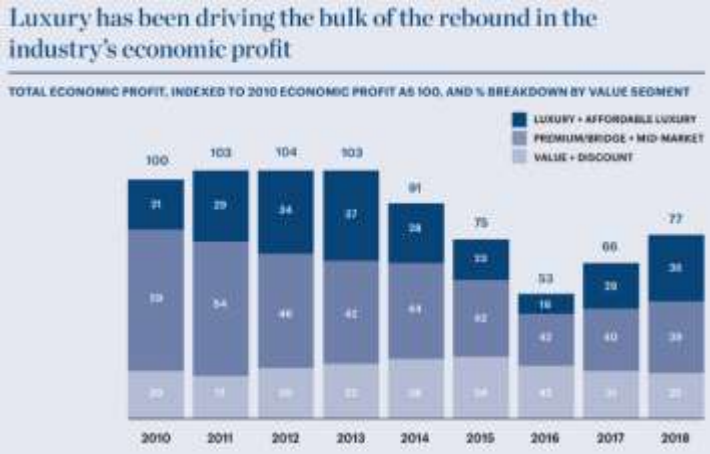


Fig. 5 - Economic Profit trend from 2010 to 2018, breakdown for value segments. Source: McKinsey et Al. 2020.

An additional measure adopted by McKinsey Global Fashion Index is the Economic Profit, which comprises operating profit less adjusted taxes and cost of capital. Fig. 5 shows the breakdown of this metric according to the value segments and we immediately notice that premium and mid-market have progressively lost their dominant position, leaving more and more economic profit in favor of both higher and lower-end segments. Particularly, luxury has been the most volatile segment but from 2016 it is gaining momentum, driving the overall sector growth; in 2018, Luxury and Affordable luxury accounted for 36% of the total operating profit. Total shareholders return also confirms the relevance of the luxury segment, which had the highest percentage with 22%, followed by the value segment at 14%. Substantial difference if we consider premium and mid-market, which had 1% and even -2%. These bad performances reported by premium and midmarket companies are due to an increase in selling, general and administrative expenses that consistently impacted EBITDA. Differently, what caused the decline in profit of value and discount segments, is the rising sourcing costs and increased markdowns (McKinsey, 2020).

Looking for the last time at Fig.3, we can focus on the product categories and immediately notice that *sportswear* is the category that has scored the greatest growth in recent years, maintaining the highest growth rate at 6% to 7%. The main contributors to this growth are large giants such as Nike, Adidas, and Lululemon that, thanks to huge investments in product development and marketing, constantly feed demand, especially from the younger segments (McKinsey 2019). *Clothing* instead has shown signs of a slowdown, mainly due to the emergence of new and sustainable business models, which discourage the continuous and fast buying of clothes, and are meeting more and more identification, particularly among the youngest. However, the impact will probably be offset by growth in emerging markets (McKinsey 2020). Growth in *jewelry* and *watches* remain low, and these categories may struggle in many markets as rental models are starting to replace traditional direct sales. *Handbags* and *luggage* will continue to perform well as luxury brands manage to capitalize on the growth in tourism from regions such as mature Asia-Pacific, China, and the Middle East. (McKinsey 2020). Two kinds of purchase attitudes emerge then from this sectorial analysis: users either go for major investments in luxury products, or they seek value (McKinsey 2020). Middle-ground positioning is a very risky strategy that may hamper survival within the fashion industry since the market may not perceive distinctively the unique features of a brand identity. Furthermore, sportswear is gathering momentum and is bound to become the main product category, which will drive future industry results.

Middle-ground positioning is a very risky strategy that may hamper survival within the fashion industry since the market may not perceive distinctively the unique features of a brand identity.

1.5. PLAY HEAVY OR GO HOME

Despite the large number of firms operating in the industry, most of them are almost unknown to the public and only a few have reached a large size and drive the overall industry results. This phenomenon is referred to as *industry polarization* when a relevant gap exists between some best-performing companies and the rest of the market; continued investment in products, improved customer experience, a strong focus on the digital sphere, are just a few areas where these giants build their competitive advantage. Great evidence supporting this trend is captured by McKinsey Global Fashion Index and shown in Fig. 6.

Most of the value generated by the industry is captured by just a small percentage of players, in a "*winners take all*" kind of competition. Specifically, the top quintile accounts for more than 200% in 2019, which is possible because the other companies contributed negatively. The bottom 20% indeed, accounted for -95% of the economic profit, whereas the middle quintiles have seen their contribution decrease to -9% in 2019 (Fig. 6) (McKinsey et Al. 2020 - 2021). Incredibly, the percentage of value destroyers more than doubled between 2011 and 2018, reaching the incredible figure of 56% (McKinsey et Al. 2020); in other words, within the fashion industry more than half of the companies are value-destroyers. What is even harder to believe, is that the same polarization phenomenon hits even within the value-creating companies. McKinsey refers to the top 20 *Super Winners*, which accounted in 2018 for 138% out of 168% performed by the top 20%: Nike, Inditex, LVMH lead this special ranking, followed by TJX Companies, Kering, Fast Retailing (Fig. 7) (McKinsey et Al. 2020).

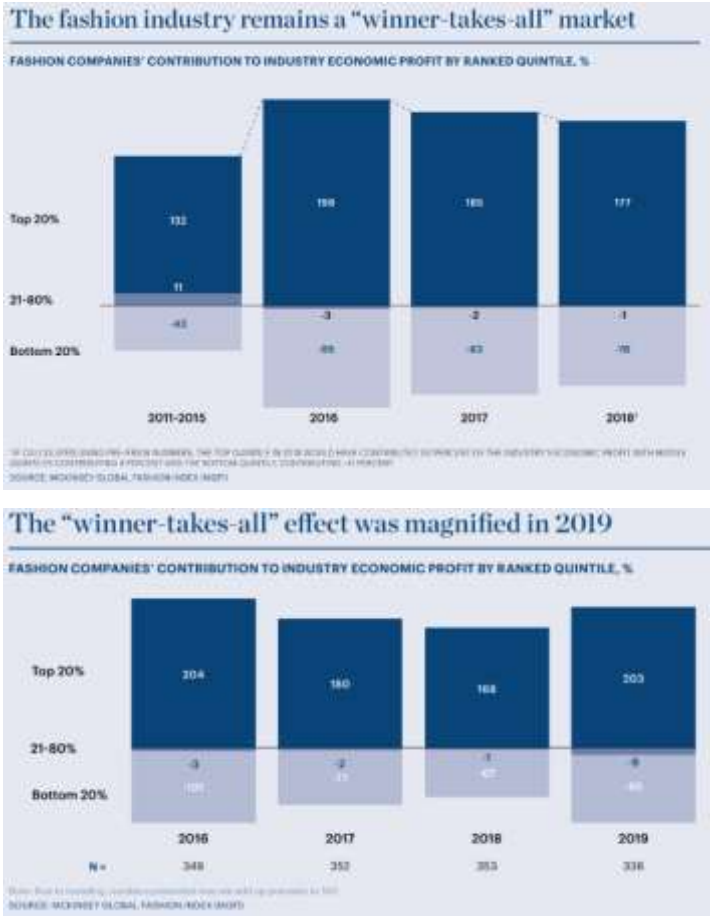


Fig. 6 - Percentage contribution of fashion companies to industry economic profit by ranked quintile.
Source: McKinsey et Al. 2020 – 2021

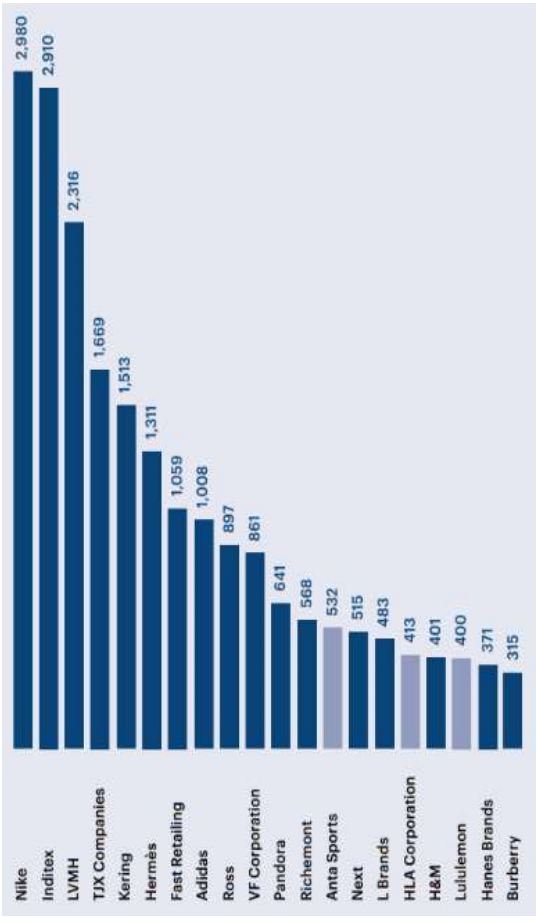


Fig. 7 - Top 20 fashion players: the Super Winners.
Source: McKinsey et Al. 2020.

Even if the top performers have strong power in maintaining their dominant position, the highest mobility rate is within the bottom quintile, with even 7% of them that managed to reach the top quintile from 2013 to 2018. Indeed, some fast-growing digital start-ups are ranked within the bottom growth despite they may leave this cluster soon because they are investing heavily to pursue fast growth (McKinsey et Al. 2020). Many other rankings exist listing always the top X companies. In its Report on Large Italian and Global Fashion Companies, Area Studi Mediobanca considers the 80 firms with the highest revenues (a top 20 view is shown in Fig. 8). Fashion United takes a wider perspective by ranking the top 200 companies and considering also private companies: Rolex, Chanel, El Corte Inglés Group, and Primark, occupy outstanding positions, respectively 7th, 10th, 13th, and 18th (FashionUnited) (Fig. 9). Along with public companies, private ones then represent a consistent market, whom McKinsey estimated to value more than $1 billion revenue in 2018, a third of *Super Winners* sales (McKinsey et Al. 2020).

	Companies	Country	Net sales 2019 (€ mln)	Employees 2019 (avg. n.)
			ranking	
1	LVMH	FR	53,670	147,715
2	NIKE	US	33,294	75,400
3	INDITEX	ES	28,286	157,537
4	ADIDAS	DE	23,640	53,216
5	H & M HENNES & MAURITZ	SE	22,280	126,376
6	FAST RETAILING	JP	18,788	56,523
7	ESSILORLUXOTTICA	FR	17,390	152,954
8	KERING	FR	15,884	34,902
9	THE GAP	US	14,583	129,000
10	COMPAGNIE FINANCIERE RICHEMONT	CH	14,238	35,657
11	L BRANDS	US	11,495	94,400
12	CHANEL	GB	10,925	26,504
13	VF	US	9,337	48,000
14	PVH	US	8,821	40,000
15	THE SWATCH GROUP	CH	7,594	36,596
16	HERMES INTERNATIONAL	FR	6,883	15,417
17	CHOW TAI FOOK JEWELLERY GROUP	CN	6,488	29,700
18	HANES BRANDS	US	6,202	63,000
19	PUMA	DE	5,502	13,348
20	RALPH LAUREN	US	5,483	24,900

Fig. 8 - Top 20 global fashion players. Source: Area Studi Mediobanca, 2021.

Fig. 9 - Top 20 global fashion players. Source: Fashion United, 2021

Cabigiosu (2020) estimated the minimum size to survive as an independent global luxury fashion firm to be one billion euros; especially in Europe, several small family businesses have a strong brand image, reputation, a clear value proposition, and positioning but still lack the resources to face threats and opportunities. A theoretical explanation of the increasing polarization lays in the peculiarities of small firms. Most fashion companies suffer from either the so-called *liability of newness* or *liability of smallness* or even both. Compared to older incumbents, young companies lack social capital, meaning all those resources that a player can access, just for being part of a social network that has been built over time. On the other hand, size also matters, since big players have always slack resources, whole business units, and even subsidiaries, that exist to make cash-flows always available for whatever opportunity or threat to come. Attracting human capital is also a major advantage, being these huge companies more appealing for talents since they can offer better monetary and non-monetary rewards (Cristina Rossi Lamastra, 2019).

Organic growth, through natural business maturation, is a viable growth strategy but some exogenous factors make it often not sufficient, and particularly within the fashion industry. Speed has become a dominant paradigm of today's age, along with information reliance and increasing uncertainty. Consequently, firms need not only to have ambitious growth goals but also to achieve them quickly. Hence, inorganic growth through M&A operations is then a convenient alternative to escape quickly from this "size trap" and gain enough market and bargaining power. The number of M&A operations indeed have been growing in the last years (Fig. 10) (Statista, 2021) and in this way, the huge fashion groups like LVMH, Inditex, H & M, FastRetailing, Kering, but also independent brands such as Nike, Adidas, Chanel, have grown and reached tremendous market capitalizations and turnovers.

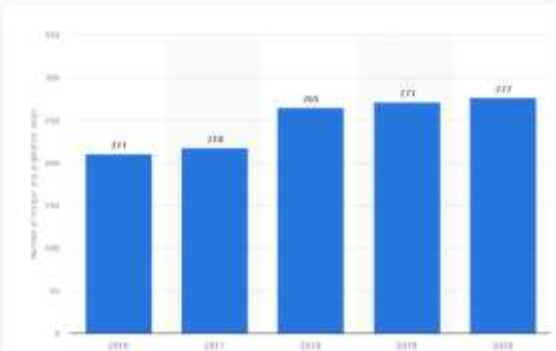


Fig. 10 - Fashion and luxury goods M&A deals worldwide from 2016 to 2020. Source: Statista, 2021.

We find it thought-provoking that the sales of fashion giants equal some national GDPs, despite the two categories of entities are not nearly comparable in terms of people involvement. If we then consider also that the employees are not capturing the biggest slice of value, the wealth concentration appears to be relentless. Industry polarization though not only applies to the gap between best-performing firms and value destroyers, but it is appropriate also from a geographical point of view. Among the 80 leading fashion companies considered by Area Studi Mediobanca, 38 are located in Europe (47,5%), 30 in North America (37,5%), 9 in Asia (11,25%), and only 3 in Africa (3,75%). As for the sales repartition, more than half of aggregate revenues (56%) are attributable to European companies, a sign of the strength of the old continent in the fashion industry, followed by North America (34%), Asia (8%), and Africa (2%). (Fig. 11, Area Studi Mediobanca, 2021). The fashion industry is, therefore, a concentrated industry, where few players own great market power and drive the whole industry. If we compare the geographical areas, the industry is nearly a monopolistic market, with Europe and North America seizing most of the value generated. Competition though is a force that poses strong positive pressure on companies, acting primarily on the offering: products and services need continuous innovation to be perceived as different, meaningful.

Innovation can improve quality, reduce financial and environmental costs, widen choice, lower prices, improve access to products. From a systemic perspective, competition generally leads to a better allocation of our world scarce resources, since firms need to be more efficient, and consequently the industry, and the whole economic system, get more efficient (Cristina Rossi Lamastra, 2019). Competition is a positive force, pushing towards efficient allocation of resources and effective market solutions, but is it strong enough in the global fashion industry? Are there enough opportunities for small companies to be born, grow up and establish in the long run?

Industry polarization is not only a matter of size, but also from a geographical point of view.
The industry is nearly a monopolistic market, with European and North American based firms seizing most of the value generated.

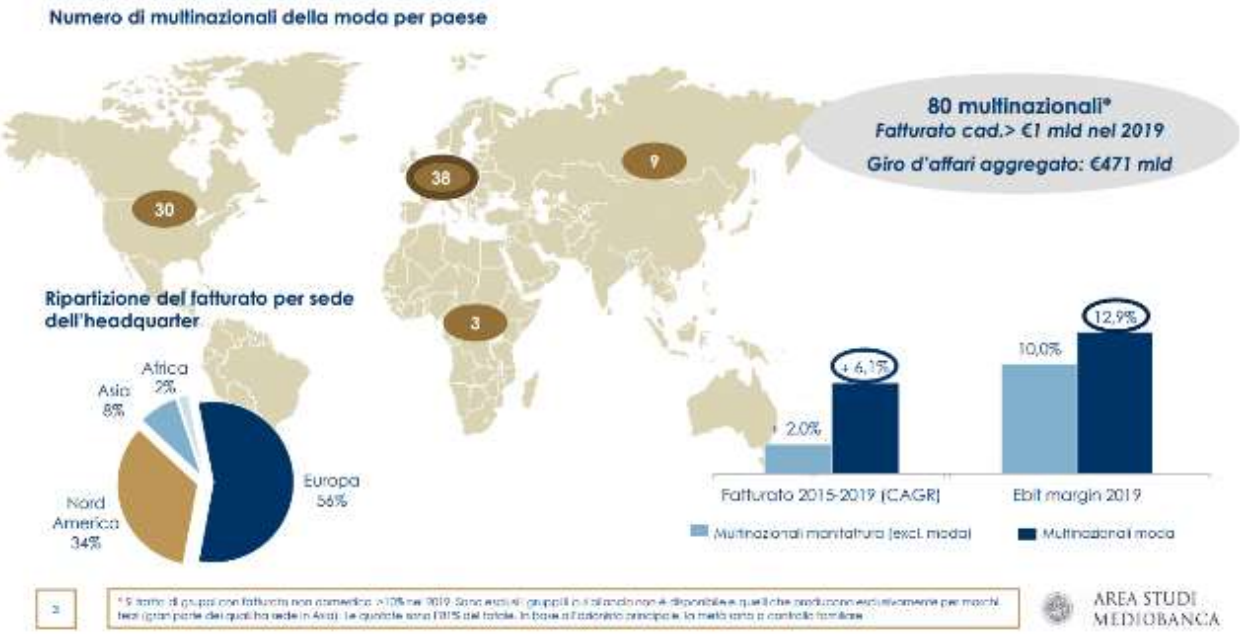


Fig. 11 – Geographical distribution of fashion companies headquarters, and revenues repartition on geographical areas.
Source: Area Studi Mediobanca, 2021

1.6. ITALY: TRADITION AND INNOVATION

Italian fashion is one of the leading industries as well as an expression of the national entrepreneurial DNA. The supply chain relevance is clear: 80 billion in turnover and almost 500 thousand employees, respectively 8.5% and 12.5% of the Italian manufacturing industry (EY et Al. 2020). Value added by the aggregated Italian fashion industry companies contributes to 1.2% of national GDP and recorded higher growth rates if compared with it (Area Studi Mediobanca, 2021). Great importance is also for exports, with fashion accounting for 8% of the annual manufacturing exports, which allow to meet European and North American markets, as well as the new realities of the Far East (Sistema Moda Italia, 2021). After a contraction due to the crisis of 2008, that had seen a 19% drop in exports and 15% in overall turnover, the Italian fashion industry has seen an effective strategic repositioning in the higher quality segments (Sistema Moda Italia, 2021) (Fig. 12) (Intesa San Paolo, 2018), which is showing the desired improvements in companies' margins (Fig. 13) (Euler Hermes, 2020). This repositioning has fostered international appreciation, especially in the Chinese market, which has proved to be one of the main drivers of the sector's recovery.

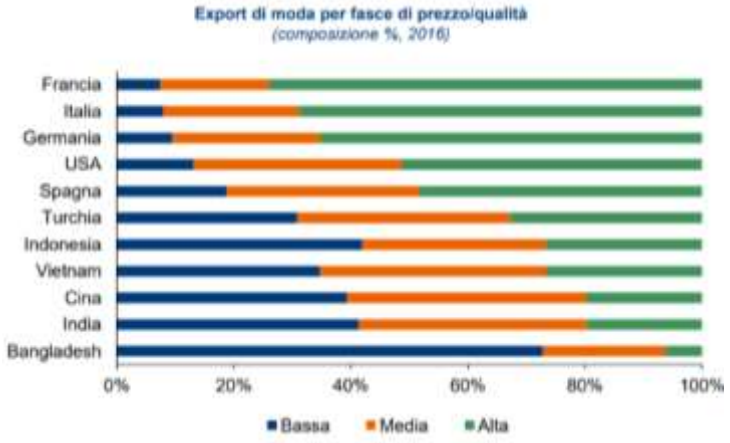


Fig. 12: Fashion exports by price/quality, country comparison. Source: Intesa San Paolo, 2019.

It is estimated that Chinese customers account for 35% of demand due to so-called travel retail, which accounts for up to 10% of company turnover, representing one of the fastest-growing distribution channels (EY et Al. 2020). Area Studi Mediobanca considers in its report 177 companies located in Italy with more than €100 million turnovers in 2019, and find that they are mostly concentrated in northern Italy (128) and operate in leather goods and footwear (42), clothing (39), textiles (16), jewelry (11), and eyewear (8). Only 13 companies are listed but 71 belong to non-Italian shareholders; especially Kering and LVMH own 14 and 10 brands and seize 7,3% and 6,5% of total Italian fashion sales respectively. The best combination in terms of profitability is described to be family-owned companies that open the shareholder structure up to the capital markets. Additionally, the medium-sized companies grew more than four times as fast as the medium-large ones (Fig. 14) (Area Studi Mediobanca, 2021). Despite the top-performing companies having reached considerable sizes, the average of Italian companies is smaller if compared with other European countries. The backbone of the Italian production system is indeed mainly composed of small and medium-sized enterprises, often organized in districts. The whole supply chain is vertically integrated, where customer-supplier relationships are fundamental and based on trust.

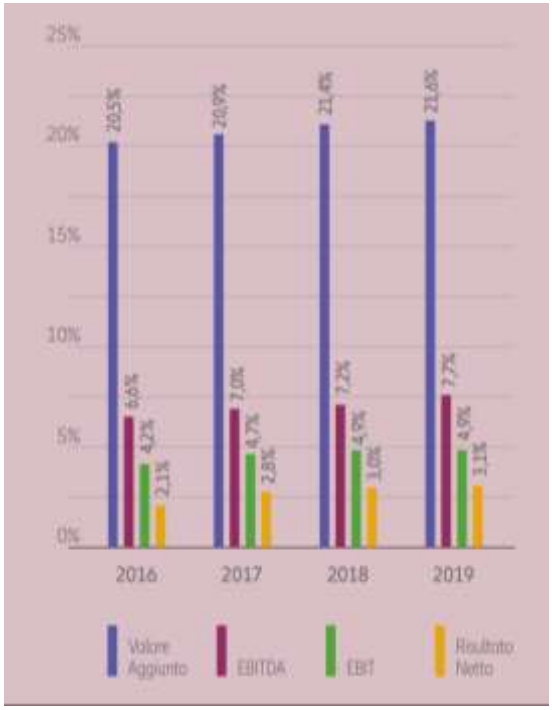


Fig. 13 - Value Added, EBITDA, EBIT, Net Profit of Italian fashion companies from 2016 to 2019. Source: Euler Hermes, 2020.

	Companies	Net sales 2019 (€ 000)
		ranking
1	PRADA	3.225.594
2	LUXOTTICA GROUP	2.953.051
3	CALZEDONIA HOLDING	2.410.888
4	GIORGIO ARMANI	2.155.806
5	MAX MARA FASHION GROUP	1.635.482
6	MONCLER	1.627.704
7	GUCCI LOGISTICA	1.608.935
8	OTB	1.497.501
9	OVS (SCHEDA SOLO FOCUS MODA)	1.374.777
10	SALVATORE FERRAGAMO	1.372.449
11	ERMENEGILDO ZEGNA HOLDITALIA	1.321.327
12	DECATHLON ITALIA	1.303.160
13	VALENTINO	1.222.316
14	D & G	1.155.952
15	ZARA ITALIA	1.116.016
16	LVMH ITALIA	1.096.451
17	LUXOTTICA	1.012.115
18	LW	976.370
19	SAFILO GROUP	939.038
20	TOD'S	915.983

Fig. 14 - Top 20 Italian fashion players. Source: Area Studi Mediobanca, 2021.

This environment fosters the propensity to create a deep relationship with the customers and to accept their requests for product customization. The level of craftsmanship and uniqueness is extremely high, and companies build their success over a strong bond with the territory. These characteristics, allow the Italian fashion industry to be very flexible and highly innovative, accounting for 10% of the entire manufacturing industry expenses for innovation (Sistema Moda Italia, 2021). Relevant is also the investments in sustainability, or towards more circular business models; as a matter of fact, the share of recycled and reused material has doubled from 2007 to 2017, reaching 13% of the separate collection (EY et Al. 2020). Moreover, the financial structure of Italian Fashion Companies appears to be quite solid and able to survive in the long run.

Italian production system is mainly composed of small and medium-sized enterprises, organized in districts, with unique craftmanship, flexibility and innovativeness.

The incidence of financial debt on equity was 33.7% in 2017, noteworthy is the good performance of clothing, with 28.9%, and leather goods, with 34.3%. The latter two sectors were also the best in terms of liquidity endowment, which is above average, with a ratio of cash and cash equivalents to financial debt of 125.2% for the former and 85.2% for the latter. (Aziende Moda Italia 86,2%) (Area studi Mediobanca, 2021). A final aspect that we would like just to anticipate and will be discussed later on, is the phenomenon of reshoring, which opposes the trend begun in the 1990s with the delocalization of low value-added and labor-intensive activities outside Italian borders to enjoy the benefits of low-cost countries (EY et Al. 2020). To tell the truth, it is precisely the local distinctive skills and the quality of made in Italy that are pushing companies to bring production (or part of it) back to Italy (Intesa Sanpaolo, 2017). What we are in fact witnessing, is the transition of new production processes, from labor-intensive activities to technology and creativity-intensive processes, and made in Italy is above all made of intangible and intricate qualities (Sistema Moda Italia, 2021).

1.7. CONCLUSIONS

This first chapter has provided us with a broad overview of the challenges that fashion companies faced in surviving and performing at their best before the advent and changes brought about by Covid-19. Initially, we focused on the context in which all businesses were operating. The keyword is uncertainty: economic uncertainty, due to a series of monetary policies that have led to a slowdown in global growth; geopolitical uncertainties, such as the trade war between China and America and at the European level with the Brexit; political uncertainties, such as the continuous upheavals that are sweeping the world, from Asia, with the protests in Hong Kong, to Latin America, with the protests in Bolivia or Venezuela. All these strong tensions and uncertainty for the future have had an impact on the performance of the fashion sector. In fact, the fashion industry that since the crisis of 2009 has managed to score an average sales growth of 2.5%, with a negative trend confirmed in 2020. In addition to this, there is a rebalancing of fashion markets that opens up new opportunities especially in the Eastern markets for companies. In fact, Western markets, such as North America and Europe, are now mature and are leaving their place in Eastern markets. The Chinese one is still the protagonist, having contributed in the last 10 years to 38% of the global fashion industry growth across segments, but there are other interesting markets among the emerging countries. For example, India, which is projected to be the fastest-growing major economy, the Middle East countries, which have the highest per capita expenditure, or Indonesia, which is the fourth most populous country with a growing middle class. We have seen that in this sector middle-ground positioning strategies are not appreciated by the market, with the Luxury and Value Discount sectors performing significantly better than the Premium and Midmarket sectors.

While in the product categories sportswear stands out over the other categories, with the highest growth rate at 6% to 7%. Furthermore, the fashion industry is a highly polarized industry, with a significant gap between the best-performing companies and the rest of the market. The top quintile accounts for more than 200% of the total value generated by the industry, while the bottom 20% indeed, accounted for -95% of the economic profit. In order to survive in this sector, a minimum size of one billion euros is required, to have the resources to capitalize on the opportunities and deal with the threats that arise. In particular, to counteract the uncertainty of the period, companies prefer to use inorganic growth strategies rather than organic ones. That's why we've seen the rise of Merge & Acquisitions, often done by industry giants. They have grown and reached tremendous market capitalizations and turnovers, further exacerbating the gap with other companies. Polarization also persists at the geographical level, where Europe and North America are seizing most of the value generated, with 56% of aggregate revenues are attributable to European companies, a sign of the strength of the old continent in the fashion industry, followed by North America (34%), Asia (8%), and Africa (2%). So this is a concentrated industry, where a few players own great market power and drive the entire industry. A sector in which competition is tough and generates a lot of pressure on industries, acting primarily on the offering: products and services need continuous innovation to be perceived as different, meaningful. The first chapter of the Literature Review concludes with a small focus on Italy, given its importance in the world and national panorama, given that with its 80 billion in turnover and almost 500 thousand employees reached 1.2% of national GDP. For Italian companies, the most effective strategic strategy is to reposition on the higher quality segments which are highly appreciated internationally, especially by the Chinese market. The average size of Italian companies is small and medium-sized, often organized into districts. Characterized by customer-supplier relationships, a high level of craftsmanship, and a strong bond with the territory.

These characteristics, allow the Italian fashion industry to be very flexible and highly innovative. In recent years we are seeing an acceleration of reshoring. The transition of new production processes, from labor-intensive activities to technology and creativity-intensive processes and made in Italy is above all made of intangible and intricate qualities. In this chapter, we have detailed the main forces and dynamics that dominated the fashion industry before the advent of Covid-19. To understand how the pandemic changed the fashion industry, it is necessary to first analyze in detail how it impacted e global economy and changed consumer habits. This excursus is done in the following chapter.

CHAPTER 2

2020 COVID BREACH

If Chapter 1 has the goal of studying the fashion industry from a pre-pandemic perspective, Chapter 2 is completely centered on the Covid-19 pandemic outbreak and how it has revolutionized our world. We will indeed remember 2020 as a year of major changes for people habits, business practices and policymaker's agenda; all this makes us say that we have already begun a journey towards a new era.

Apart from the sanitary emergency, the pandemic resulted in a severe economic crisis, among the worst shocks in our history. The American and European continents suffered the most from the immediate economic consequences of the outbreak. South Asia will drive the global GDP growth, along with the African continent and Central America.

Policymakers has behaved like tightrope walkers, finding continuously the perfect balance between containment policies and economic stimuli, to keep the death toll low and at the same time minimize the economic recession. Inevitably though, restrictive measures have caused a conjunct shock of supply and demand.

From the supply side, shocks hit harsher in case industries were classified as non-essentials and mansions are generally not suitable for remote working. From the demand side, shocks were a combination of reduced spending power, with psychological and contextual factors. Consumption is indeed a complex action that is both habitual and contextual and a global pandemic represents a full-blown contextual change, and it is straightforward to expect changes in consumption patterns.

Regardless of how people faced shelter-in-place orders, loneliness is expected to prevail in the post-pandemic and become a dominant psychological state. Digital technologies offered more than ever a way out, providing quasi-normal lives within the house walls. As a result, the pandemic had a catalytic effect on digital literacy, especially among the most disadvantaged with technologies. Similarly, the pandemic reduced information inequalities by revitalizing interest in public affair and accelerated the long-term structural changes of news industry. Though, a throwback of digital channels to access news, is the risk of extreme personalization and the spread of fake news.

Finally, we conclude this second chapter with an immersion in a post-pandemic home, thanks to *Casa Fluida*, an exhibition from Elle Décor Italia, Elisa Ossino Studio, and Marco Bay, which explore the new meanings that home has acquired, such as comfort, flexibility, functionality and sustainability.

KEY FINDINGS

1- Global GDP decreased by 3.3% in 2020 and it is the worst decline since the Great Depression of the 1930s and unemployment rate has grown by 1.8%

2- Covid-19 pandemic made a sizable contribution to stock market volatility, higher any other pandemic and third-highest realized volatility peak since 1900

3- 20% increase in internet usage during the pandemic around the world with social media and messaging services users that spent as much as 40% more time on social media

4- 40% of social media users say they are most concern about false or misleading information

5- From 2013 to 2020 smartphone usage to access news has grown from 29% to 62%, whereas in the same period computer usage has decreased from 67% to 43%

2.1. THE STRENGHT OF A DISRPUTION

31st December 2019

WHO China Country Office was informed of cases of pneumonia of unknown etiology detected in Wuhan, the biggest city in the Hubei Province of China and among the most populated Chinese cities. A few days after, China reported the first known death from an illness caused by the virus, and a short after researchers stated that the virus could diffuse from human to human: it is the official birth of Covid-19 (World Health Organization, 2020).

23 January 2020

Chinese authorities closed off Wuhan: planes, buses, trains, subways, and ferries were suspended, some 11 million people were put under tight quarantine, and face masks and social distancing became mandatory (Illmer et Al., 2021; Bryson Taylor, 2021).

30 January 2020

The Emergency Committee convened by WHO declared that the outbreak met the criteria for a Public Health Emergency of International Concern (PHEIC) and that strong measures should be put in place by countries to slow down virus spread (IHR Emergency Committee, 2020).

14 February 2020

France announced the first coronavirus death in Europe, and Italy became a few days later a major outbreak, with Lombardy locking down 10 towns and canceling cultural, sport, and any collective events. By the 22 March 2021, Italian government progressively declared the whole nation to be locked down (Illmer et Al., 2021; Gazzetta Ufficiale della Repubblica Italiana, 2020).

2 April 2020

The pandemic sickened more than 1 million people in 171 countries across six continents, killing at least 51,000 people (Illmer et Al., 2021), but still, this count is bound to rise.

December 2021

as of writing, worldwide coronavirus cases are more than 260 million with 5,1 million deaths (Worldometer, 2021).

This short timeline is to immediately realize the strength that Covid-19 has proven since it managed to reach global relevance in a very short time; from the first cases in China at the very end of 2019, it spread to Asia, in February it reached Europe, and by April 171 countries were infected. Undoubtedly, it has become the main actor of 2020, affecting almost every country in the world, bringing together all people, forcing continuously policymakers and businesses to adapt. The resilience of human beings is being challenged harshly but the efforts put in place diffusely around the globe to fight the emergency are yielding promising results, thanks especially to the vaccination campaign, with 43.3% of the world population who has received at least one dose and almost 6 billion doses administered (Our World In Data, 2021): we can finally glimpse a future out of this pandemic.

As a matter of fact, the emergency is not only making our world suffer, but it is also bringing some deep, permanent changes to our lifestyle: some habits disappeared, others strengthened, others remerged. The whole economic system has undergone rigorous restructuring to cope with the new regulations, and the many solutions adopted are not bound to be discarded after the crisis is over. This power of shaping today but also future mankind, makes us say that we are entering a new era, a post-pandemic one. New priorities are going to become dominant, new paradigms and artifacts, new patterns and behaviors, new values, and moods. We have already begun our journey towards a new era even if we do not know the destination yet. We do not know anything about our future, but the good news is that we can prepare and be ready to live it. We need to become careful observers of both past and contemporary, choose the right perspectives, ask the right questions so that we can notice any clue of where the future is leading. We have so much to learn from this disruptive experience so that we can properly refund our future world.

2.2. A NEW SHOCK TO THE ECONOMIC SYSTEM

The first images and videos of infected people and their violent reactions to the virus were shocking, but none of us could even imagine that it was only the beginning of a long period of suffering and restrictions. Initially, people, scientists, and politicians worried mainly about the threat this virus represented for human health, priority undoubtedly correct in such a case. But since more and more countries were facing a continuous increase in contagion and started to adopt more and more restrictive measures, the global attention shifted towards a major consequence that was about to come: the economic recession. It is quite difficult to assess the overall impact that the pandemic had on the global economy due to several reasons. At first, at the time of writing, the emergency was still getting to its end and the only final data available refer to 2020, and the first quarters of 2021. Additionally, the outbreak hit generally the whole world but with different degrees of severity, depending on countries and industries characteristics. GDP absolute value and its growth are synthetic indicators useful to assess the overall performance of countries, groups of countries, and even of the whole world. Exhibit 1 illustrates the most relevant data that we discuss in this chapter. The International Monetary Fund estimated the global GDP to decrease by 3.3% in 2020 and described the decline as the worst since the Great Depression of the 1930s, and for 2021, predicted a trend reversal with global growth of 6% (Jones et Al., 2021) (Fig. 15). Nevertheless, this growth will be driven primarily by South and East Asia, thanks to India, China, and other countries that have been performing continuous and remarkable growth over the last years. Indeed, even in 2020, China managed to be the only major economy to grow (+2.3%). Other countries also performed promising results already in 2020, such as Ethiopia (+6,1%), Guinea (+5.2%), Bangladesh (+3.8%), Myanmar (+3.2%), Egypt (+3.6%), Vietnam (+2.9%), Ireland (+2.5%), Côte d'Ivoire (+2.3%); Turkey, Uzbekistan, Iran, Niger, Burkina Faso, and others, also kept their GDP growth rate right above zero (Fig. 16).

American and European continents suffered the most from the immediate economic consequences of the outbreak, particularly the central and south American regions, and Eastern Europe; unfortunately, Italy negatively outperformed the average EU countries, with a reduction of GDP growth rate of -8.9% (Tab. 1). As quickly mentioned before, South Asia will drive the global GDP growth, along with the African continent and Central America. Yet some differences exist among these three macro areas; it appears that in contrast to Asia, Africa will show an increasing year-by-year GDP growth rate in the long run. On the contrary, by looking at the service-reliant economies, such as Italy, European countries, and more generally the most developed economies, will suffer much more difficulties to recover from the violent impact of the pandemic, and their GDP growth rates are expected to settle down to around 1.5% from 2023 (Jones et Al., 2021; Tab.1).

American and European continents suffered the most from the immediate economic consequences of the outbreak. South Asia will drive the global GDP growth, along with the African continent and Central America.

Stock markets are also useful to get an insight into the economic impact of the pandemic. All the major stock markets reacted negatively to the growth in the number of Covid-19 confirmed cases, even more proactively if compared to the growth of deaths (Ashraf, 2020). This might be interesting from a psychological point of view, seeming that the extent and promptness of the virus spread are perceived as frightening, more than the growth of the actual number of deaths. Particularly, the Covid-19 pandemic made a sizable contribution to stock market volatility, much higher than any other previous pandemic and the third-highest realized volatility peak since 1900; taking the U.S. stock market as a proxy, Baker, and colleagues (2020) describe indeed this pandemic as an extraordinarily high peak in volatility by historical standards, and it is almost entirely triggered by the Covid-19 developments, including policy responses to the pandemic. Fig. 17 shows U.S. stock market volatility, January 1900 to April 2020, and the main

drastic events that caused the highest peaks by historical standards.

Another critical issue is unemployment, whose increase is a strong signal of economic recession. In 2020, it increased by +1.8%, causing an overall 6.6% of the global population unemployed, which roughly consists of more than 520 million people.

As for 2021, it is expected to settle down to 6.2% and retake its downward trend undergoing from the peak of 2010, after the 2008 economic crisis (Fig. 19). South America and Africa (even if data on the African continent are limited to South Africa, Morocco, Sudan, Algeria) suffered a relevant increase in the unemployment rate during 2020, and this situation will continue in 2021; also, the South European countries will show sign of distress with an increase in unemployment rate forecasted for 2021 (Fig. 18). This data enforces the reasoning made before about the perspectives of recovery which differ radically from region to region, with east and southeast Asia being the most promising emerging countries, whereas Africa and South America are suffering more the effect of the pandemic, especially in terms of unemployment rates.

This paragraph is accompanied by an exhibit to help visualize the extent of the economic crisis induced by the Covid-19 pandemic. Indicators shown are those explained in the previous lines, GDPs decline, stock market volatility, and unemployment rates. We can surely conclude that this pandemic is among the worst shocks that our economic system faced. Besides, the emotional response of people is also a relevant factor to be considered since it appears that this pandemic has been frightening not only for the actual risk of dying, but for some bigger perceived threat; it may be linked to the total lack of control we experienced, and to the impressive speed of diffusion.

The sample period runs from January 2, 1900, to April 30, 2020. From December 1925 onward, returns are computed using Yahoo Finance's "adjusted close" series for the S&P 500 (^GSPC). Before that, returns are from the Global Financial Data extension of the Dow Jones index. In both panels, we calculate realized volatility as the sum of squared returns over the past 10 trading days.

Fig. 17 – U.S. stock market volatility peaks, from 1900 to 2020 (Baker et Al., 2020).

EXHIBIT 1

GLOBAL GDP GROWTH RATE

Source: IMF (2019), “GDP growth rates”, retrieved on 2021/08/19 at [https://www.imf.org/external/datamapper/NGDP_RPCH@WEO/WEOWORLD]

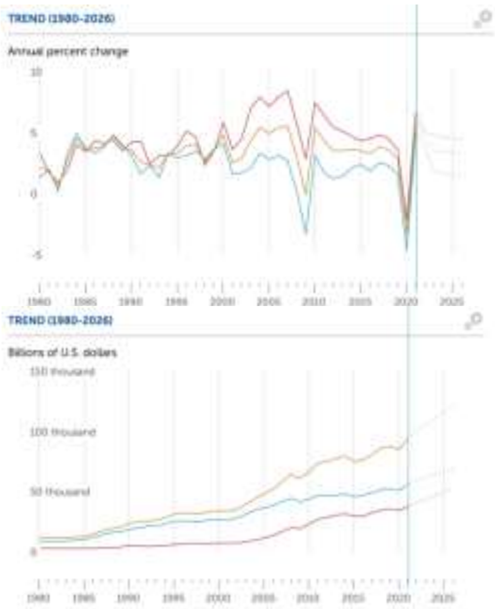


Fig. 15 – Global GDP growth rate trend 1980-2020

Real GDP growth (Annual percent change)	2020	2021	2022	2023	2024	2025	2026
World	-3.3	6	4.4	3.5	3.5	3.3	3.3
Major Advanced Economies (G7)	-5	5.4	3.6	1.5	1.4	1.4	1.3
Advanced Economies	-4.7	5.1	3.6	1.8	1.6	1.5	1.5
Emerging Markets and Developing Economies	-2.2	6.7	5	4.7	4.6	4.5	4.4
Europe	[illegible]	4.4	4	2.2	1.8	1.7	1.7
Eastern Europe	[illegible]	3.9	4	3.8	2.6	2.9	3.3
Western Europe	[illegible]	4.5	4	1.9	1.7	1.6	1.6
Emerging and Developing Europe	-2	4.4	3.9	3	2.8	2.7	2.7
Italy	[illegible]	4.2	3.6	1.6	0.8	0.8	0.8
North America	[illegible]	6.2	3.4	1.5	1.9	1.8	1.8
Central America	[illegible]	5.6	4.1	4	4	4	4.1
South America	[illegible]	4.4	2.8	2.5	2.3	2.3	2.3
Middle East and Central Asia	-2.9	3.7	3.8	3.6	3.5	3.3	3.4
South Asia	[illegible]	[illegible]	8.6	6.6	6.5	6.3	6.4
East Asia	0.8	7.1	4.8	4.5	4.3	4.1	4
Emerging and Developing Asia	-1	8.6	6	5.8	5.7	5.5	5.4
Africa (Region)	-1.8	4.5	4.1	4.1	4.1	4.2	4.2
North Africa	-1.7	7.8	4.6	4.2	4.3	4.3	4.4
Sub-Saharan Africa	-1.9	3.4	4	4.1	4.1	4.1	4
Australia and New Zealand	[illegible]	4.5	3.6	2.4	2.3	2.4	2.5

Tab. 1 – Real GDP growth, projections 2020-2026, breakdown by countries

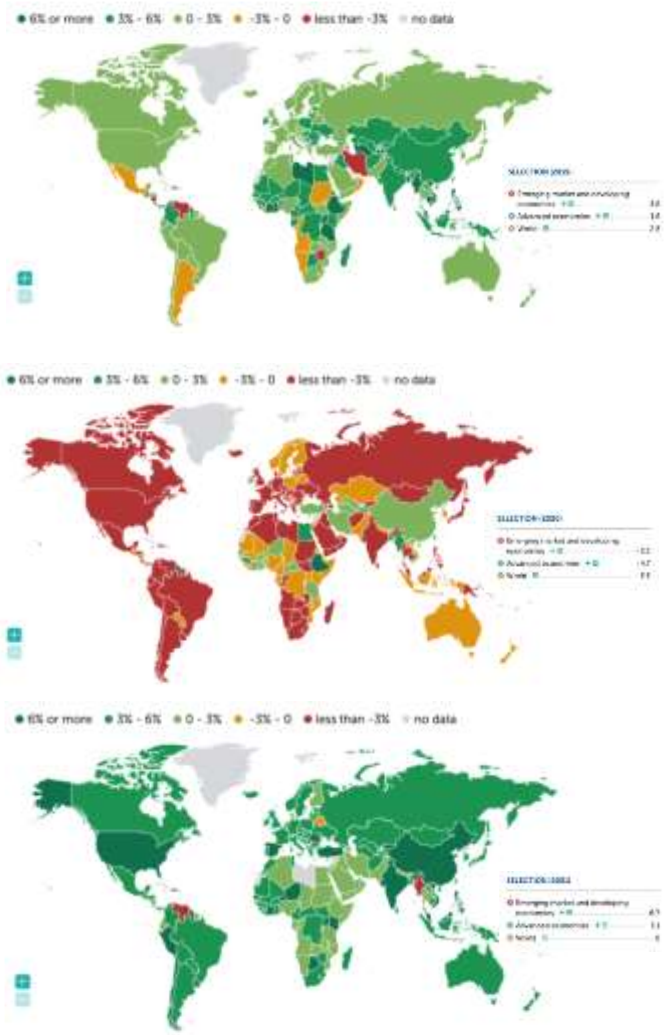


Fig. 16 – GDP Growth Rates per countries 2019 – 2020 – 2021

UNEMPLOYMENT RATE

Source: IMF (2021), "Unemployment rates", retrieved on 2021/08/19 at [https://www.imf.org/external/datamapper/LUR@WEO/OEMDC/ADVEC/WEOWORLD]

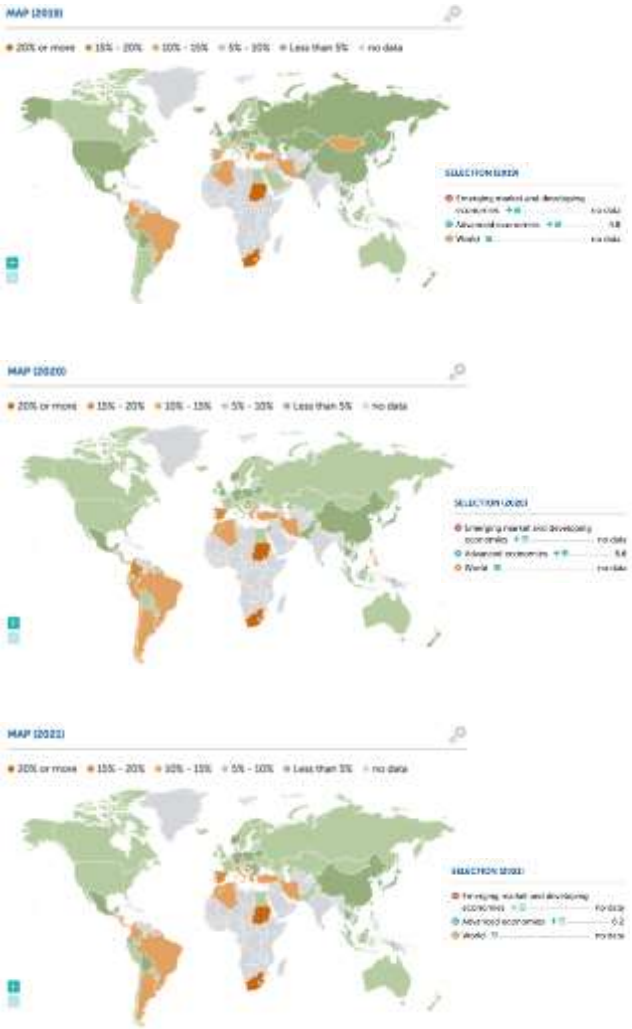


Fig. 18 – Worldwide unemployment rate 2019 – 2020 – 2021

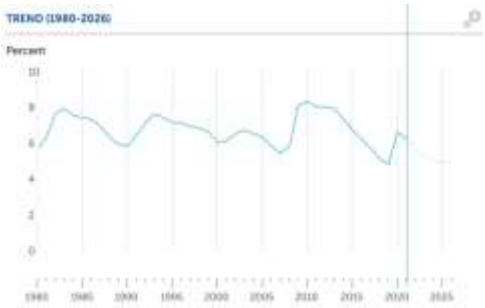
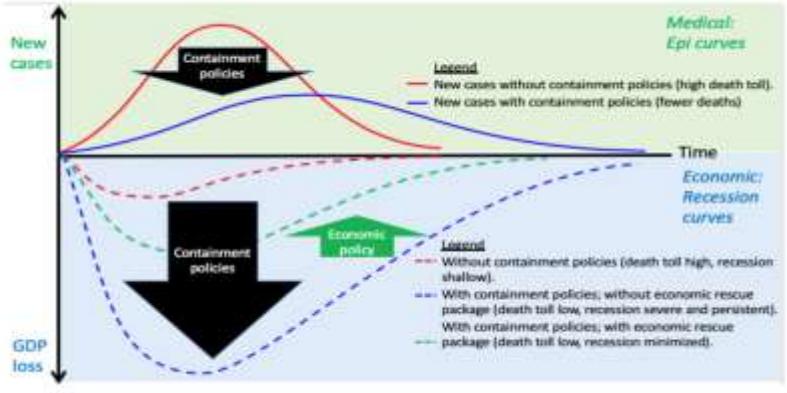


Fig. 19 – Unemployment rate trend 1980 – 2021 and forecast until 2026

2.3. POLICYMAKERS: THE TIGHTROPE WALKERS

Politicians, journalists, scientists, but also every one of us argue every day about the measures underwent by governments. Sometimes they seemed to be ineffective, not comprehensive, even unrespectful of basic human rights. It is fair to say that in deeply uncertain times, with urge pressure and the need to act responsively, with a high risk of offending people's rights, decision-making becomes immensely challenging. Political ideologies blend with scientific and economic knowledge to try to forecast any consequence of governmental actions, but it is very difficult to get in advance a clear and comprehensive idea of the actual effects of policies. The core trade-off that policymakers faced is well summarized by Richard Baldwin (2020) within the so-called two-curved problem. From the medical point of view, to slow down the contagion it was necessary to keep everyone apart since it is almost impossible to continuously distinguish who is infected and who is not to restrict only the latter: severe limitations to all people transfers were the best strategy to limit the virus spread. On the other hand, hampering people's freedom of movement causes an undesired effect on the economy: the recession curve (Fig. 20).

Figure 3 The recession, made worse by containment policy, can be mitigated with economic policy.



Source: Author's elaboration based on Gourinchas (2020).

Fig. 20 – The Double Curve problem: epidemiologic and recession curves. Visualization of the effects of containment policies and economic policies.

With shelter-in-place orders, workers could not commute to factories and offices, triggering a supply-side recession; at the same time, people could not enjoy free time outside, reducing drastically consumption and triggering a demand-side recession. The effect of containment policies on the recession curve is therefore hideous, but governmental economic stimulus packages acted as a parachute, by fostering spending through vouchers, fiscal incentives, and other economic policies. Nevertheless, the gigantic containment policies reduced drastically both production and demand. As a matter of fact, goods and service categories have been hit differently, but the value of real production has fallen and the double restrictive effect on both demand and supply sides hit harshly the whole economic system. Baldwin expressed concerns about a few months-long government restrictions in March 2020 and at the time of writing, Italy as well as most countries worldwide have experienced several months of lockdown, during the first half of 2020 but also in the late 2020 – early 2021, concurrently with the so-called second wave of contagion. As for the future, new restrictions are not to be excluded in case of the resurgence of the virus spread.

The economic recession coming from this pandemic is then quite different from what has usually happened in downturn times when a downfall in demand undermines the whole system foundations. Governments have always had a rescue role, helping people, firms, and even other nations to survive. This time instead, the same actions to protect people and counteract the sanitary emergency, are also causing economic recessions. Policymakers are behaving like tightrope walkers, finding continuously the perfect between containment policies and economic stimuli, to keep the death toll low and at the same time minimize the economic recession. Of course, we would like to suspend any kind of judgment over the policymakers' effectiveness, because of the extreme complexity and for our lack of knowledge and expertise to assess this topic. We want instead to stress another relevant aspect.

and instead, stress another relevant aspect. The risks of a pandemic have been taken into consideration for a long, and it is likely that in the future new viruses will come with pandemic potential. The 2020 outbreak proved that we lack readiness. We need to invest in prevention and coordinate international efforts to avoid at first another pandemic to explode, and secondly that sanitary care and access to meds will not become again a source of inequalities around the globe.

2.4. DEEPENING THE SUPPLY SHOCK

A given fact is that the pandemic crisis did not hit all the industries in the same way and with the same intensity. We would like then to identify some factors at the industry level, which affected the promptness of reaction to the pandemic outbreak. Certainly, within each industry, firms define strategically how to differentiate themselves from competitors, and this may result in being more ready to face uncertainties; yet, some industries' characteristics are common to competitors, and are responsible for exposing more, or less, companies to pandemic-related events. The most evident characteristic is the typology of industries' offerings, which can range from physical goods sold by human sales assistants in large retail stores to messaging platforms instantly accessible by people all over the world and managed by a complex algorithm or AI. These are just two extreme examples to understand intuitively that some business models are much more exposed than others to a sanitary emergency like the Covid-19 pandemic.

Fig. 21 – Maslow's Heirarchy of Needs. Source: Donawa, 2017

The first dimension to discuss is the industry essentiality. Are the products and services offered necessary to people? Referring to the first Italian Prime Minister ordinance, issued in March 2020, the industries categorized as essential are those satisfying the primary needs of both people and our society. For this reason, Agriculture, Animal Products, Food, and Beverage, have been allowed to operate physically as well as the production and distribution of our society's productive factors, such as Coal, Oil, Gas, Water, and Energy, without which our society simply could not survive. People could not go outside home for months, therefore all the services related to couriers and in general, transportation of goods by sea, water, and air have been authorized to deploy personnel physically. Finally, Financial, Legal, and Accounting Services, Cleaning Services, Call Centers, Education, and, of course, Healthcare, are listed among the essential industries. From this quick and summarizing overview, we see that the logic to distinguish essential and non-essential industries rely on identifying which are the services and goods essential for both people and the infrastructure we live in. We can refer to the Maslow pyramid of needs (Fig. 21), and notice that the industries listed as essential, are the ones addressing the two lowest levels: physiological and safety needs. This holds especially true for the food and beverage industry and, of course, Healthcare, and Cleaning services. As for Transportation and Productive Factors, we can see those as physiological needs of our contemporary complex socio-economic system. The problem with this classification lays in the assumption that only what is necessary has been allowed to operate as usual, whereas it does not take into consideration the effects on all those industries that have not been allowed.

Supply shocks are direct consequences of government restrictive measures which affected harsher in case industries were classified as non-essentials and mansions were not suitable for remote working.

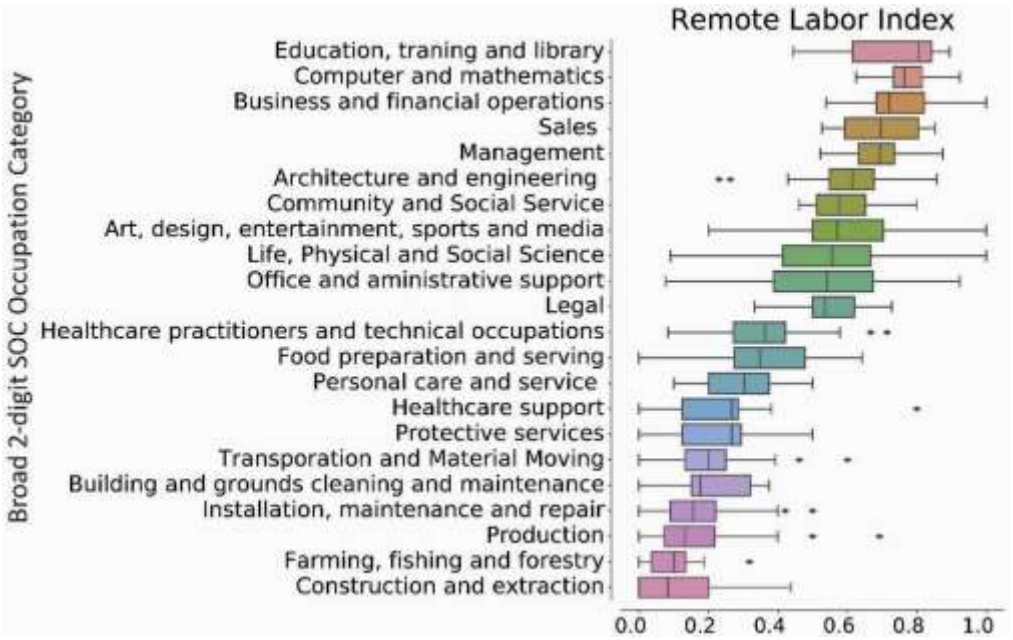


Fig. 22 – Remote Labor Index. Source: Maria del Rio-Chanona et Al. 2020

In other words, another major aspect should be taken into consideration is the concrete feasibility of converting mansions into forms of remote working. Some jobs that can easily be transferred at home and relate to Education, Training, Computer, Mathematics, Business, and Financial. On the contrary, the occupations more rigid to this conversion relate to Production, Farming, Construction, and Extraction (Maria Del Rio-Chanona et Al., 2020) (Fig. 22). Firms operating in industries that require a high presence of human capital are more challenged because the physical attendance of employees in factories and plants is fundamental. In case these industries were not classified by Governments as essentials, firms suffered tremendous supply shocks.

On the other hand, within industries that offer services to people such as Education, Assistance, and Sales, workers can quite easily work remotely, and consequently, the supply shocks were not so relevant, independently by being classified as essentials or not.

To conclude this reflection upon the supply side, the shocks are consequences of government restrictive measures which affected hasher in case industries were classified as non-essentials and workers' occupations are difficult to be converted into remote working (Maria Del Rio-Chanona et Al., 2020); additionally, it is very likely that all those industries which easily turned to remote working will keep it as a future standard and will compete to establish new frontiers of agile best practices

2.5. DEEPENING THE DEMAND SHOCK

Along with the supply shocks analyzed in the previous chapter, the overall global downturn has been driven also by shocks in demand. Nevertheless, there is the main difference regarding the root cause of these shocks. Also, in this case, the restrictive measures put in place by policymakers played a key role in determining demand shocks. Directly, since people have been forced at home for months and could not go out and consume. This implied that any economic agent had to adapt their distribution channels and reach people directly at home or guarantee the correct safety measures within the few physical stores open. Consequently, the categories of goods and services that were not considered essential by governments experienced tremendous demand shocks, particularly those structurally difficult to be delivered at home. A second-order effect of containment policies traces back to the supply shocks itself, which caused steep income loss (Maria del Rio-Chanona, 2020). Naturally, this decrease in wealth and wages translated directly into a contraction of demand for several goods categories, especially the less essential ones. Finally, the third cause is the psychological effect that the pandemic-related events had and are still having on people. The sanitary emergency and the subsequent disruption of daily activities weakened consumer confidence (Padhan, 2021), even towards what was usually considered as solid habits. Consumption is indeed a complex action that is both habitual and contextual (Sheth, 2020), meaning that the context plays a relevant role in affecting consumer habits. Several are the contextual events that may influence people's choices, for example, major life events such as pregnancy and marriage, or a technological breakthrough for example PC and smartphones. Rules and regulations are other contextual factors that help discourage or encourage the consumption of specific goods; two examples are alcohol and vaccine respectively. Surely, a global pandemic represents a full-blown contextual factor along with the policies to contain the health crisis, and it is straightforward to expect changes in consumption patterns.

Some peculiar behaviors arouse as an immediate reaction which, despite being temporary, are still very interesting to investigate.

One of the first reactions has been stockpiling some products categories, a consumption behavior known as hoarding (Sheth, 2020) or panic buying (Hall et Al., 2021). People run to buy large stocks of those products that are perceived as the most essential, such as disinfectants (Degli Esposito et Al., 2021), nonperishable food (Lehberger, 2021), cleaning products, toilet paper, and even water (Kirk and Rifkin, 2020). The response varied across countries, meaning that consumers engage in panic buying or hoarding for different categories of products depending on where they live: in developing countries (case of Pakistan) people tend to hoard items like rice, cooking oil, and flour; in the developed countries instead, the items hoarded related to toiletries, masks, and sanitizers but not food (Islam et Al., 2021). This difference in the product categories targeted by hoarding behaviors, underline the fact that this kind of behavior is attributable to profound psychological reactions, strongly affected by contexts; hence, the differences in products categories reflect the economic development of the countries.

Consumption is a complex action that is both habitual and contextual.
A global pandemic represents a full-blown contextual change and it is straightforward to expect changes in consumption patterns.

The act of collecting and safeguarding many possessions represents an attempt to defend against perceived threats and regain control of lost freedom; possession helps oppose the feeling of loss and contributes to a sense of security (Kirk and Rifkin, 2020). According to psychological reactance theory (Clee and Wicklund, 1980), the threat of product unavailability is perceived as a loss of control and increases the perceived need for the threatened object (Lehberger et Al. 2021).

The shortened store hours and limited shopping time increased the urgency and panic consumers (21. Islam et Al.), and this perceived lack of control contributes directly to stress, which consequently impacts depression; in a depressive state, people are more prone to impulsive and compulsive buying behaviors (Sneath et Al. 2009; Islam et Al. 2021). It is then a sort of self-fulfilling process: the more anxiety people experience due to the scarcity, the more quickly products will end up sold out (Islam et Al., 2021). Some degree of hoarding can be considered positive, as a prudent behavior for reducing the shopping frequency and to protect against future unavailability (Lehberger et Al., 2021). Nevertheless, consumers engaged in hoarding behavior beyond what is needed, as an emotional response (Sneath et Al., 2009), and even adopted a competitive mindset in which they see others as adversaries, which led to territorial behavior (Kirk et Al. 2018). Hoarding behavior is strongly connected with the emotional reaction caused by fear and anxiety due to natural disasters such as this pandemic; when this emergency will be over, these behaviors of course will cease to exist, but in the meanwhile, people taste might suffer permanent changes. Apart from the categories of products and services which witnessed a sales spike due to the psychological reactance of hoarding, most industries went through severe times. If we consider for example entertainment, hospitality, and transportation, we easily realize that firms simply met no demand, since people were forced to stay at home and many services are impossible to be delivered at home. Except for these structural impossibilities, the pandemic had a wider impact on some consumer behaviors, changing the frequency of significant consumption (Degli Espositi et Al., 2021). Some expenses have been simply delayed, giving rise to the so-called pent-up demand; this is often associated with durable goods and appliances or discretionary services such as concerts, bars (Sheth, 2020). Other expenses are instead bound to decrease to a permanently lower level due to changes in preferences of consumers (Maria del Rio-Chanona et Al., 2020) or to the rise of new alternatives, more convenient and accessible (Sheth, 2020).

As regards foods, media, and telecoms instead, people considered them as essential and did not change the frequency of consumption; consequently, the industries did not experience any demand shock. In the case of discretionary expensive durable goods, we can quite confidently say that people simply postponed these expenses and will recover the consumption later;
for example, big entertainment events or travels, for which containment policies played a major role in determining relevant demand shocks (Maria del Rio-Chanona et Al., 2020).

The pandemic had a wider impact on some consumer behaviors, changing frequency of significant consumption. Some expenses have been simply delayed; others are instead bound to decrease to a permanently lower level.

Interestingly, a behavioral pattern observed several times is that when an existing habit is abandoned, it usually comes back as a recreation or a hobby (Sheth, 2020), and we can think about fishing, gardening, baking bread, etc.; what it is interesting is to understand how the shopping activity will evolve after a long period of unavailability.

2.6. WANDERING LONELY IN THE DIGITAL

The confinement orders all over the world forced billions of people at home for months. For some families, this has turned to be an opportunity to spend time together as they were not used to doing it for a long, but for a lot of people, it was a hard time to go through. Non-resident students and workers had to decide whether to get back home or face the lockdown far away from relatives, lovers have been taken apart, and friends could not enjoy each other's company. Social exclusion increases the perception of physical vulnerability (Dean at Al., 2019) hence it magnifies the perceived pandemic threat and may have long-term effects on our psychological states. Kirk and Rifkin (2020) argue that the moral injury we have suffered has the power to shape self-identity but remains to be seen how these world views will be formed by positive characteristics such as empathy, tolerance, interconnectedness, and resilience, and negative ones such as bitterness, insularity, and defeat. Regardless of how people faced shelter-in-place orders, loneliness is expected to prevail in the post-pandemic and become a dominant psychological state (Wang et Al., 2021). With different degrees of intensity, every one of us experienced loneliness to the point that we witnessed some curious phenomenon. The need for belonging is indeed one of the most fundamental human motivations (Baumeister and Leary, 1995) and to cope with the pandemic-related events, people showed innovativeness and resiliency to meet this need (Kirk and Rikfin, 2020). Pet adoptions and orders to puppy breeders witnessed a huge increase during the pandemic (Phillips, 2020), and even the interaction with anthropomorphized digital entities such as Alexa and Siri could have mitigated the effects of social exclusion (Mourey et Al., 2017). Someone opted for even more drastic solutions, such as quaranteaming, forming teams to face quarantine periods in good company; especially for those who live on their own, hunkering down with a few people might sound very appealing (Hohman, 2020).

In any case, creating new connections arouse as a way to find consolation and digital technologies have not missed the opportunity to address these issues and provide new solutions. Video-chats, delivery apps, coworking platforms are just a few examples of how digital technologies offered quasi-normal lives without living our house walls. Industry data shows that there has been an approximately 20% increase in internet usage during the pandemic around the world (Islam et Al., 2021) with social media and messaging services showing even more relevant figures: globally, online users spent as much as 40% more time on social media, whilst in Italy, 60% of respondents were spending longer on messaging services (Watson, 2020). Social media effectively respond to the need for connectedness, to the point that reunions with friends and family through video calls have become regular and scheduled. But here a vicious cycle may exist, since technological communications are very different from real social interactions, so an extreme reliance on these media may then cause new loneliness (Sheth, 2020). Consumers seem also to be recognizing that reduced psychological distance, through the usage of digital channels, is still no substitute for physical proximity to others (Kirk and Rifkin, 2020).

Regardless of how people faced shelter-in-place orders, loneliness is expected to prevail in the post-pandemic and become a dominant psychological state.

Though the shift towards digital technologies might seem straightforward for younger people, launching in the market new digital solutions is not sufficient to reach the most vulnerable population groups, like elder people, who need the training to interact smoothly with the digital world (Xie et Al., 2020). Over the past few decades, information technology has been continuously, yet the harsh reality is that elder people's adoption and uses lag that of the youngest, creating and growing digital inequality (Wang et Al., 2021; Xie et Al., 2020). Despite this risk of marginalization, Covid-19 had a catalytic effect on digital literacy, empowering particularly those considered disadvantaged with technologies (10. Sheth, 2021).

Restrictions orders were a serious challenge for our psyches, due to both the perceived threat of the virus and loneliness. The long-term effects are not quite clear but a stronger signal comes from the digital world. We can confidently state that a great share of the population has earned access and confidence with digital solutions thanks to the pandemic and many digital habits are not bound to cease with the emergency end.

2.7. BENEFITS AND DRAWBACKS OF DIGITAL NEWS

The threat of the pandemic raised great interest in most people to the point that the research for information and following news have become key activities, substantially increasing the amount and frequency of news consumption. Particularly, citizens who were previously more unrelated to news became more reconnected; in a way, the pandemic reduced information inequalities by stimulating people to get more informed and by revitalizing interest in public affairs (Casero-Ripolles et Al., 2020). Digital technologies disrupted, among the others, the communication and entertainment industries, offering solutions easily accessible and capable of connecting the whole world. Social media have enabled billions of people to have news and content from all over the world right in their pocket, yet the media system shows a hybrid nature, with a fully established symbiotic co-existence of old and new media (Casero-Ripolles et Al., 2020). The sanitary crisis is very likely to accelerate the long-term structural changes of the industry, towards a more digital, mobile, and platform-dominated environment (Newman et Al., 2020). At the same time, we are witnessing a resurgence of the legacy media, namely television, which boasts credibility and trust in the eyes of a large share of people (Casero-Ripolles et Al., 2020).

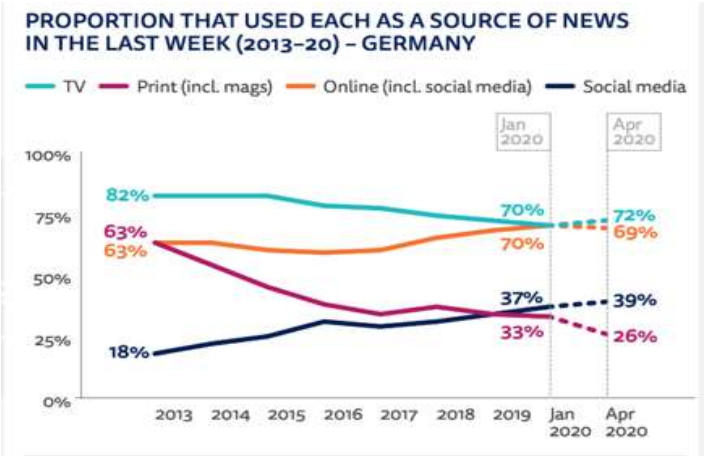


Fig. 23 – Relative importance of news channels.
Source: Reuters Institute Digital News Report 2020

The exceptional coverage given by television to Covid-related events might explain this resurgence, electing in the eyes of people television as the main source of information for pandemic news. Printed newspaper, on the other hand, has fallen, even more, undermined by the physical restrictions (Newman et Al., 2020), apart from the undergoing decline that has been taking place for decades (Fig. 23). Citizens' interest is strongly directed towards content, not to the media itself, meaning that they use a combination of different media to obtain the information they seek, and social media do allow users to look for almost any content at any time. Though this vastity of the information displayed by digital platforms is at the same time their main weakness, because of the easiness in the circulation of fake news, made-up information which spread among citizens astutely imitating regular news and taking advantage of existing public beliefs, to influence and destabilize society and institutions, generating confusion and anxiety (Casero-Ripolles et Al., 2020; Waisbord, 2018). It is therefore the credibility of social media that makes it still difficult to establish themselves as the main sources of information, but age is a relevant moderating factor (fig. 24).

The pandemic reduced information inequalities by stimulating people to get more informed and by revitalizing interest in public affairs.
It has accelerated the long-term structural changes of the news industry, towards a digital, mobile, and platform-dominated environment.

If we focus on younger users, indeed, it is twice as likely that they access news via social media rather than through websites, apps, or offline channels, and are less connected with news brands (Newman et Al., 2020). From a long-term perspective then, social media will become the main informative media, and gaining the trust of users will be critical to successfully convey messages and information (fig. 25).

Fig. 24 - Relative concern of fake news for channels. Source: Reuters Institute Digital News Report 2020

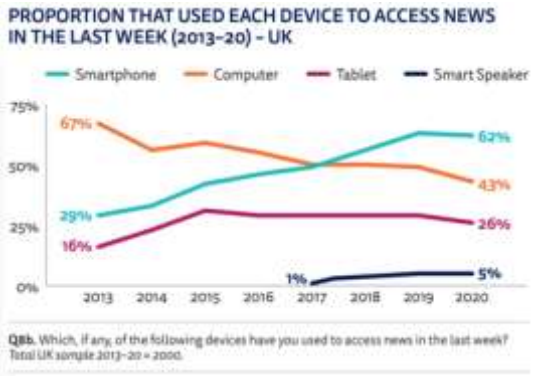


Fig. 25 - Relative importance of devices to access new. . Source: Reuters Institute Digital News Report 2020

However, this long-term vision should also take into consideration some less pleasant aspects, which are very well shown in the movie "The Social Dilemma". We like to consider it an almost dystopian, but necessary reflection on the power of the internet and social media. As Roger McNamee explains in the documentary if you Google for example "climate change ...", people will not get all the same suggested searches, there are those who will get "...is a hoax", others "... is destroying nature", and so on. The results provided by Google have nothing to do with the underlying problem, climate change, but simply depends on where you are typing and what Google knows about the person who is making that search; all ruled by an algorithm. Social media also works the same way: on your main page, everyone will see content from people who share the same opinions as you, and the user likely starts to believe that his opinion is an important and shared idea. Is like everyone is immersed in a completely different world, with a different reality and different facts. Once in this state, however, users become easy to manipulate since they believe to be in control; they can add their friends, follow their pages, but it is Facebook that pulls the strings behind everything (Roger McNamee - The social dilemma, 2020). This has led to the increase of polarization within the society, which is also driven by the way the recommended content mechanism of social media is structured. Once the user has seen a video or a post, a related one is immediately recommended and so a cascade starts until the user starts thinking that everyone shares their opinion (Guillaume Chaslot, The Social Dilemma, 2020).

With these considerations in mind, the previously mentioned fake news problems find their explanation; the algorithm is becoming more and more efficient in convincing people of the truthfulness of fake news. Especially, if we see that fake news spread 6 times faster on Twitter than real news (Vosoughi, 2018). The system we live in direct people towards fake news since those are the most profitable (Tristan Harris, The Social Dilemma, 2020). The pandemic period could not be outdone, indeed we witnessed an explosion of conspiracy theories denying the actual pandemic, condemning the attempts to establish a sanitary dictatorship, or even suggesting alternative, non-scientific cures to the vaccine. A final worrying aspect is that social media can also be used as a weapon, and we can the example of Myanmar. In this country Facebook is the main social media, suffice it to say that when people buy a cell phone, the store owner installs it and opens a Facebook account for them. Social media became the first app that citizens learned to use but unfortunately, Facebook has given the military a way to manipulate public opinion and encourage incitement of violence against Rohingya Muslims (Cynthia M. Wong, The Social Dilemma, 2020).
Social media can also intervene and drive elections, such as with the Russiagate scandal, in which Russia is speculated to have manipulated the 2016 American election. Today, countries no longer need to physically invade a country to influence its government but can simply ask Facebook to help identify a wide set of profiles that meet certain characteristics, easily manipulated and therefore susceptible to fake news; even more sadly, all of it happens at a low price (Licata, 2018).

2.8. HOME REVOLUTION

Home is probably the environment that underwent the major revolution, in terms of spaces, furniture, and, above all, meanings. Sheltering at home, people had to adapt their activities: working, studying, practicing sports, and even meeting with friends suddenly had to be performed within the house walls. With time flexibility but severe location rigidity, the boundaries between work and life got blurred, so that schedule and compartmentalization have become necessary (Sheth, 2020). If we consider pleasure activities, hobbies, or fitness no one could argue that this blurred boundary is not beneficial. Things are quite different when it comes to couple work with childcare, familiar and personal issues, without the usual help from relatives, friends, or professionals during normal times. Indeed, a pronounced decrease in family satisfaction in the aftermath of the lockdown exists for mothers, fathers, and those without children alike, as well as a less pronounced decline in work satisfaction (Möhring et Al., 2021). After the first reactions, lockdown periods were also the opportunity to explore some areas of our personality we did not know, especially as regards creativity. Mainly led by emotional responses to the fear of losing control, people began to copy with it, by exerting control in other domains and adopting new behaviors; for example, do-it-yourself projects and home-bound activities such as cooking, baking, gardening, jigsaw puzzles, and family game nights (Kirk et Al. 2020). Substantial evidence has documented that consumers place a higher economic value on their co-created products, such as a self-assembled bookcase (Norton et Al., 2012) or self-designed t-shirt (Franke et Al.,2010) than on identical products made by someone else. Such co-creation efforts, known as presumption (Xie et Al.,2008), bolster consumers' feelings of competence (Mochon et Al. 2012) and pride, which may be especially important when consumers feel a loss of control in other life domains due to a pandemic. Many consumers also derive great pleasure from sharing the results (Kirk et Al. 2020).

Further, virtual reality allows individuals to create adventures anywhere in the world. From playing virtual poker in a casino (Roose, 2020), to climbing the highest mountains (Carter, 2020) creativity abounds. Home began transitioning into make-shift offices, classrooms, broadcast studios, gyms, places of worship, and doctors' office (Kirk et Al. 2020). An example of how a house can be adapted to all this is shown by the "*Casa Fluida*" presented at Supersalone and designed by Elisa Ossino Studio, with landscape design by Marco Bay (fig. 26). Their project focuses on comfort, the flexibility of spaces and functions, the immediacy of advanced technological interfaces, sustainability, and the relationship with nature. There is also the presence of furniture with low environmental impact and is easy to sanitize. The name of the project "Casa Fluida", literally "fluid home", wants to emphasize how the environments of this house, can change, thanks to the use of soft walls, curves, and curtains, which open and close. The sliding curtains allow you to isolate and reopen to socialize according to the needs, always with the idea of circularity here declined in macro and micro scales, from walls to furniture. In this way, it is possible to create different environments to be used in different ways depending on the needs: to study, work, relax.

Fig. 26 – Casa Fluida, presented at Supersalone. Source: Redazione Digital, 2021

2.9. CONCLUSIONS

Considering the disruptive force of Covid-19, this chapter has been useful because it has shown the main changes that the pandemic has brought. Changes have not only shaken the whole economic system, because of the new regulations adopted to cope with this event, but also because it has brought permanent changes in people's lifestyles. For this reason, we can say that, although we cannot predict the future, we are certain to enter a new era: the post-pandemic era. Once the period of medical emergency is over, this pandemic leaves as a bad memory an economic recession, defined as the worst since the Great Depression of the 1930s, and a stock market with very high volatility, much higher than any other previous pandemic and the third-highest realized volatility peak since 1900. Specifically, countries in Eastern Europe and America are particularly affected. Companies must be prepared to face this period of crisis, knowing that the recovery will be driven primarily by South and East Asia, thanks to India and China. Another serious problem they will have to face concerns unemployment, which has increased by +1.8%, causing an overall 6.6% of the global population unemployed, which roughly consists of more than 520 million people. In this context of an emergency, we have seen how politicians have collaborated with the scientific community trying to intervene promptly, even at the risk of offending people's rights. Policymakers in their choices have found themselves in a continuous trade-off between the medical curve, with measures to try to counter the spread of the contagion, and the economic recession curve, with package spending through vouchers, fiscal incentives, and other economic policies to try to mitigate the impacts of lockdowns on consumption and production. Production was not interrupted in all sectors. Those industries defined as essential-have still been able to operate, adopting agile working measures where possible.

What is certainly more important from a business perspective, is it is very likely that all those industries which easily turned to remote working will keep it as a future standard and will compete to establish new frontiers of agile best practices.
On the demand side, we have seen that the reduction in wealth has led to a delay in the purchase of some durable goods and appliances or discretionary services. While other expenses are instead bound to decrease to a permanently lower level due to changes in preferences of consumers. The economic agents had to adapt their distribution channels and reach people directly at home or guarantee the correct safety measures within physical stores. We have also witnessed hoarding phenomena, as an emotional reaction caused by fear and anxiety. The phenomenon of hoarding has a substantial difference depending on where it occurs. In developing countries, people tend to hoard items like rice, cooking oil, and flour. While, in developed countries instead, the items hoarded were related to toiletries, masks, and sanitizers. These behaviors of course will cease to exist, but in the meanwhile, people's taste might suffer permanent changes. The psychological state that we will see dominating as a result of this period is that of loneliness. On the one hand, digital technologies have mitigated the need for contact, on the other hand, communication with these media is very different from real social interactions, so an extreme reliance on these media may then cause new loneliness, generating a dangerous vicious cycle. Despite this risk of marginalization, Covid-19 had a catalytic effect on digital literacy, empowering particularly those considered disadvantaged with technologies. Information inequalities have also been reduced. In particular, social media are emerging as the main informative media, with also possible negative effects, such as the increase of fake news or the polarization of information that can influence the masses. Finally, the home has undergone profound transformations in terms of both space and meaning. As people have to spend more and more time at home, whether for work or leisure, new homes will be all about flexibility and high-tech functionalities. Now that we have seen the impacts of Covid on the economic and social system, in the next chapter we will ask ourselves about the effects that this pandemic has brought to the fashion industry.

CHAPTER 3

If in the first chapter, we have taken a pre-pandemic perspective to analyze the long-lasting dynamics of fashion, and in the second we extensively explored the consequences of Covid pandemic in our socio-economic system, this third paragraph is aimed at depicting the post-pandemic fashion scenario.

The chapter opens with an economic analysis, where fashion industry emerges as one of the most affected sectors during the pandemic. This is due to the discretionary nature and low perceived urgency of products, which caused serious demand shock. The over-reliance on China for the earlier production stages, caused even more severe supply shock when lockdowns started to spread. Luxury is expected to lead the resurgence, thanks to digital channels and the Chinese market relevance. The companies that have performed better in this period are those with a large business relevance in the APAC region and with a strong focus on online channels. The overall tremendous results caused a lot of companies' financial distress, which will prompt a new wave of M&A operations.

Also in Italy, fashion scored the worst results among the manufacturer sectors, due to mainly drop in tourism as well as supply shortages from Asia. It is expected an unemployment increase of around 30-38%.

When observing economic figures, we might forget of who really paid the harsh price of this pandemic: workers. Indeed, the unbalances of actual fashion value chain caused the worst effects to be localized in the less developed countries. The pandemic has shown once again inefficiencies and inequalities of our socio-economic system and particularly of the global fashion value chain.

Covid disruption opened on the other hand a major opportunity to quicken the digitalization process, since fashion had a late start in this transition. DTC brands as well as pure digital players are gaining momentum especially among investors. Though, their inability of converting expectations into concrete results is shifting a bit the attitude of investors, who are now more prudent. In any case, offline channels will still be a relevant channel for fashion, but collaborating with online platforms is not an option anymore.

Finally, the chapter concludes by analyzing how radical changes in consumer behaviors happened, due to both shelter-in-place orders and remote working. Companies that promptly adapted to the new situation gained a relevant image advantage, which will help fight the general decrease in fashion consumption. Above all, pandemic seems to have awakened a social consciousness, which will see the raise of second-hand, repairing, localism and durable design.

2021 FASHION SCENARIO

KEY FINDINGS

1- Reduce spending on discretionary products, and particularly 70% are reducing their spending on apparel

2- Europe was expected to be the most affected area, with a drop in sales between 22 and 35%, while the U.S. only 17 and 32%; the least affected region is China, with a drop between 7% and 20%

3- The percentage of companies that are value destroyers has increased in 2020 and have reached a peak of 73%

4- Pandemic-related shutdowns boosted digital sales from 16% to 29% globally, and those who benefited the most were the pure marketplaces thanks to their flexible business model

5- Western brands had reportedly canceled $2.8 billion of orders only from Bangladeshi suppliers, leaving manufacturers with liquidity shortages and difficulties in paying employees: some 9% of garment factories closing permanently and affected the livelihood of more than 2 million workers

6- User preferences changed with 37% that they will continue to choose online channels after the pandemic

3.1. THE ECONOMIC IMPACT OF THE PANDEMIC

As previously discussed, the economic impact of Covid-19 and the pandemic-related events was led by a joint shock of both supply and demand, and industries have obtained results that strongly differ depending on both industry and firm-level characteristics. As far as fashion is concerned, many are the issues that made the negative effects propagate widely among most players. Firstly, fashion products have a discretionary nature and a low perceived urgency, features that negatively affect demand in periods of high uncertainty. Consumers in both European and U.S. markets are forecasted to reduce spending on discretionary products, and particularly 70% are reducing their spending on apparel (EY et Al. 2020). Only 48% are instead saying that the economic uncertainty will prevent them from making general purchases that they would otherwise have made (McKinsey et Al. 2020), meaning that the demand shock for fashion was tougher if compared to other industries. Containment policies also have played a role, inevitably lessening domestic demand with people forced to reduce their free time spent outside and consequently shopping activities. Considering the supply, the fashion industry has not been considered among the most essential ones, and therefore not been protected a lot governmental restriction orders. Additionally, the peculiarities of fashion production processes made it hard for the industry to switch to remote working.

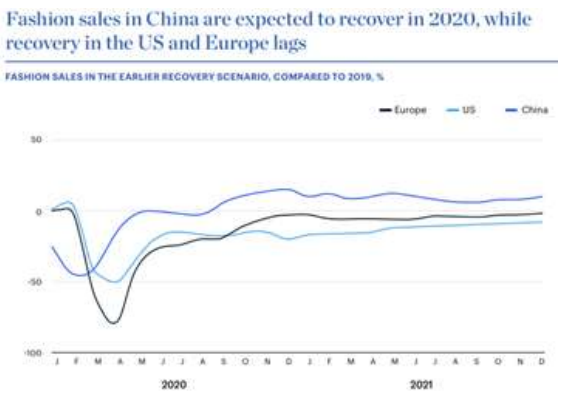


Fig. 27 – Fashion industry sales 2019 – 2021 (forecasted), highlighting the impact of Covid in different geographical areas. Source: McKinsey et Al., 2021

As a result, most of the plants and stores have been closed, and workers have been left at home for months. Unfortunately, these closures have become definitive for a lot of players. Many multi-brand boutiques have seen a sharp drop in liquidity due to rent payments and excess inventory; venture-backed companies that have always focused on growth rather than profits found themselves in dire straits as venture funds scale back investments. More than $30 billions of sales in the US were under financial distress already by September 2020, and more than $20 billion in Europe (McKinsey et Al. 2021). And more, in 2020 number of bankruptcy filings increased; a relevant example is the case of the historic US menswear company Brooks Brothers, which announced the use of Chapter 11 receivership proceedings at the beginning of July 2020, after closing 51 stores out of 250 (EY et Al. 2020). The figures of revenues and profit drops in 2020, speak for themselves. Europe was expected to be the most affected area, with a drop in sales between 22 and 35%, while the U.S. only 17 and 32%; the least affected region is China, with a drop between 7% and 20% (Fig. 27). McKinsey Global Fashion Index reported an overall revenue fall of 34% from quarterly results published in April, May, or June 2020, and predicted economic profit to drop by 93% (Fig. 28).

Fashion products have a discretionary nature and a low perceived urgency, which negatively affect demand in periods of high uncertainty. Neither it is a business easy to convert remotely, which caused serious supply shocks too.

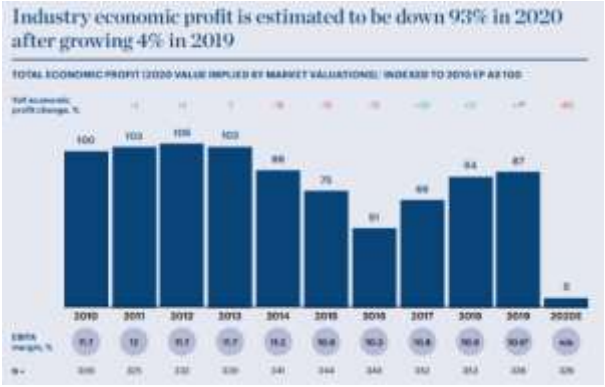


Fig. 28 - Fashion Industry economic profit 2010 – 2020. Source: McKinsey et Al., 2021.

Asia and Europe were the first continents to face the consequences of the outbreak, following the pandemic spread. In Europe, the first effect witnessed was the blockage of tourist flows from Asia and the Middle East and the following collapse of travel retail, which contracted between 60 and 80% in 2020 and is predicted to remain subdued until 2023 or 2024 (McKinsey et Al., 2021). The U.S., on the other hand, was the last area to be affected in terms of time and the main reason for the domestic demand drop is attributable to the contraction of middle-class disposable income (EY et Al. 2020). Another interesting consideration that helps understand why the fashion industry has been so hard hit, lays in the fact that the whole pandemic started in China. The initial Chinese lockdowns caused the first delays in deliveries, but it was just the beginning. The problem is that the whole industry relies profoundly on China, for almost any step of the value chain; in the early stages of production, China holds around 60% of global fashion production, from raw materials to weaving and knitting (Fig. 29). This over-reliance of the fashion system on a single nation nullified any attempt of a diversification strategy since the global supply chain showed its inability to fulfill the whole demand without China's contribution. With the spread of coronavirus throughout the countries and the consequent containment policies, all the upstream players faced hard times and only the larger-scale suppliers, with a multi-national footprint, gained an advantage (McKinsey et Al., 2021). The wide pandemic impact has extended to 2021: State of Fashion 2021 foresees two different scenarios, consisting in a fall by 15 to 20% in the Earlier Recovery scenario, or even by 25 to 30% in the Later Recovery scenario.

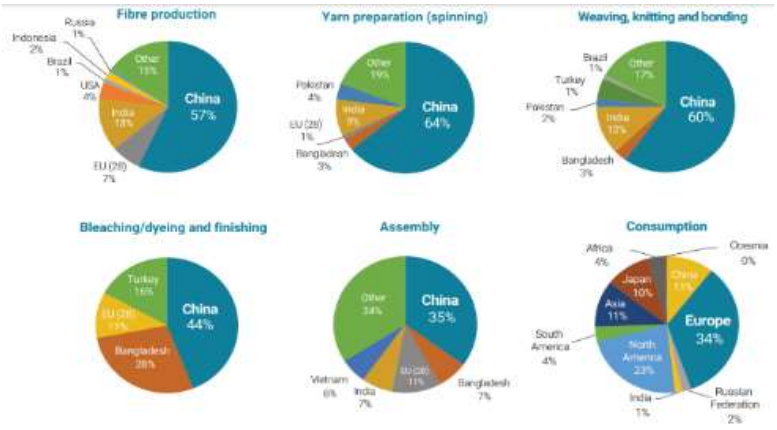


Fig. 29 – Geographical distribution of activities throughout the supply steps. Source: UN Environmental Programme 2020.

The problem is the over-reliance of fashion on China: in the early stages of production, China holds around 60% of global production. This nullified any attempt of diversification strategies, since the global supply chain showed its inability to fulfill demand without China.

As far as the old continent is concerned, in the Early recovery scenario, fashion spending will partially recover in 2021, and Germany may be able to do so already in the third quarter of 2021. Taking a global perspective, the full recovery of fashion sales to pre-crisis levels will not come before the third quarter of 2022 (McKinsey et Al., 2021). Focusing on the top companies of the industry, meaning the brands that commercialize products, we can spot some differences that may help us identify strengths and weaknesses of the current fashion system. European companies have suffered more from the crisis than American companies in terms of both net sales and margins. If we look at the first nine months of 2020, we find that sales of the old continent brands fell by 22.9%, while for the American ones they fell "only" by 19.7%. The increase in costs, mainly due to employee protection costs, inventories writedowns, fixed costs of stores, has also affected the EBIT margin of companies, which has fallen by 10.9% for European companies and 7.3% for American ones (Fig. 30).

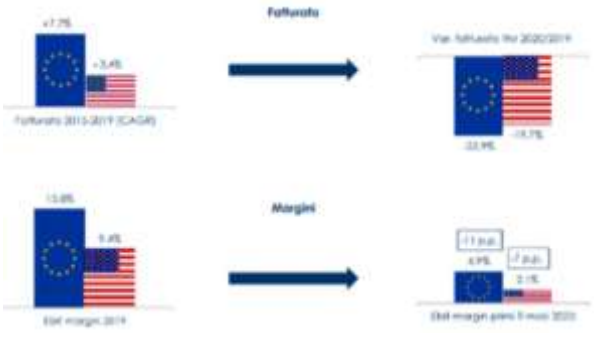


Fig. 30 – Sales and Margins analysis 2020 post-pandemic, breakdown for U.S. and E.U. based companies. Source: Area Studi Mediobanca, 2021.

Nonetheless, at the end of 9M 2020, the European companies were still more profitable than the US ones (Ebit margin 4.9% for the former, 2.1% for the latter), despite the unprecedented setback. In 3Q and 4Q the sector showed promising signs of recovery, with an average increase in net sales of 17% (Area studi Mediobanca, 2021). Share markets are also a good indicator to study at least the elite of fashion, a small group of firms that make up the sector. All companies have had a contraction, some more marked, others less severe. For example, Ferragamo performed worst with -45%, whereas Hermès only reached -15% (Fig. 31). The latter has been found to be the most resilient company, thanks to its economic and financial solidity but also its artisanal business model; altogether, it managed to recover until the same value of the 2020 beginning of the year. Other Italian companies such as Tod's and Ferragamo have been in more difficulty. (EY et Al. 2020).

Looking at the industry sectors, luxury will once again prove to be the best performer and will lead the recovery. Luxury revenues and margins were down 26% and 15% respectively between February and June 2020, while the overall market was down 34% by revenues and 21% points by margins (McKinsey et Al. 2021). According to Lunelli, president of Altagamma, 2021 will be the year of recovery for luxury, with a definitive return to pre-crisis levels by 2022; this growth will be diffused throughout the product categories (avg. +14%), driven by digital retail expansion (+22%) and the expansion of Chinese market (+18%) (Altagamma, 2020). As a matter of fact, being China the first nation to be hit by the virus, it was also the first to react and able to have earlier reopening.

For these reasons, China will strongly lead the resurgence of global fashion: despite a decrease in physical flows of customers, the conversion rates and number of transactions per client have both improved. An explanation may be the phenomenon defined as revenge shopping, according to which Chinese customers would reduce spending outside their borders to increase the purchase of foreign brands at home (EY et Al. 2020). This is also confirmed by the survey conducted by BCG and Altagamma, which states that 73% of Chinese consumers confirm that in the next 12 months they will do at least half of their annual luxury spending in China even if they used to do it abroad. This new dynamic, driven by returning demand, is expected to boost luxury market projections for China at a faster pace than estimates before the Covid-19 pandemic (Boston Consulting Group et Al., 2020). The only companies that have performed good results even during the pandemic, were those with a large business relevance in the APAC region since these are the countries that have shown the quickest recovery to the pandemic. The other beneficial characteristic is being digital players since they over-rely on the internet which has shown nothing but a boost because of the pandemic. (Fig. 32) (Fig. 33).

Fig. 32 – Comparison between market cap of fashion companies with strong presence in APAC region and the rest of industry. Source: McKinsey at Al., 2021

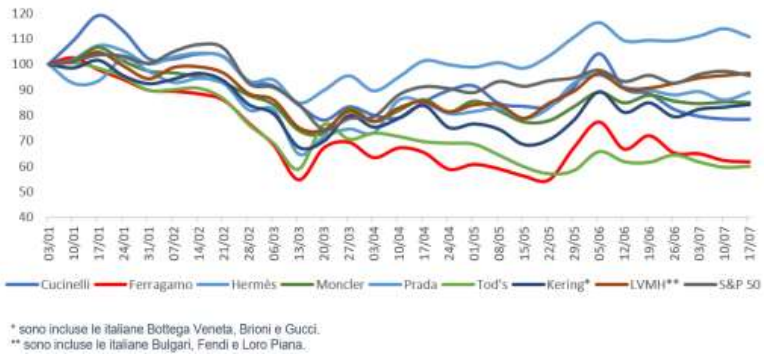


Fig. 31 – Fashion public companies stock prices from January to July 2020. Source: EY et Al., 2020.

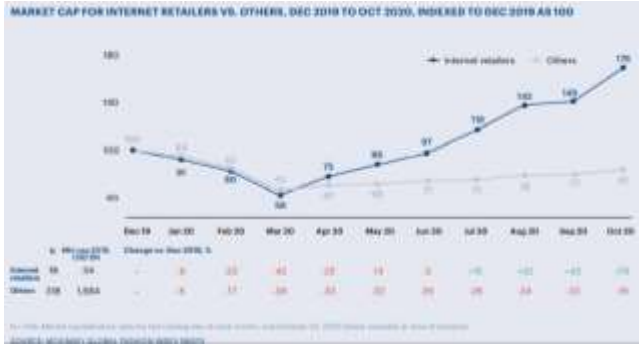


Fig. 33 – Comparison between market cap of fashion internet retailers and the rest of industry. Source: McKinsey at Al. 2021.

For all the other companies, government subsidies have been necessary to survive and drive recovery. Without subsidies and other government support, the analysis shows that 75% of European companies would be in financial distress in 2021, based on the sample of 73 listed fashion companies from the EMEA region (Europe, Middle East, and Africa) with more than $250 million in net sales. With partial subsidies and a weaker recovery, the proportion of distressed companies could fall to 58 or 52% with a stronger recovery (McKinsey et Al., 2021). As a result of the crisis spread, a phenomenon that is likely to be even accelerated will be Merges & Acquisitions. As soon as the situation will be slightly improved, private equity and strategic investors will find a great opportunity, since they will have at disposal many companies in financial distress or with significantly market undervaluation (Bianchi et Al., 2020): indeed, the sector has fallen on average by 33% year-to-year, down to a minimum of 7.8x enterprise value over EBITDA (Fig. 34).

Who will rape the most of benefits, will be the large fashion giants, Asian and Middle Eastern investors, that will improve their portfolios by disposing of less profitable businesses and acquiring the most profitable (or less distressed) realities (McKinsey et Al. Update 2020). The crisis brought about by Covid will then accentuate the phenomenon of polarization, strengthening the position of "Super Winners" companies (Fig. 35) In the stock markets, super winners have also performed better: in the period December-March 2020 they fell by 29% against 38% of the average total market, and in October 2020 they already managed to recover 11% from pre-crisis levels. (McKinsey et Al. 2021). On the other hand, this scenario of closures and lockdowns has accelerated the decline of those companies showing signs of financial distress, which were about 34% of the listed fashion businesses in North America and Europe (McKinsey et Al., 2020). The percentage of companies that are value destroyers has increased, which according to McKinsey in 2020 have reached 73% of companies (McKinsey et Al. 2021).

Fig. 34 – Enterprise value to EBITDA multiple of fashion companies from 2008 until the drop of 2020.
Source: Boston Consulting Group, 2020.

Fig. 35 – Market cap of fashion companies from December 2019 to October 2020, breakdown for Super Winners and the rest of the industry.
Source: McKinsey et Al., 2021.

3.2. FOCUS ON ITALY

The Italian fashion system has found itself facing an overwhelming phenomenon hard to fight to the point that it has recorded the worst performance compared to other Italian manufacturing sectors (Prometeia, 2021). The sector performed an overall reduction in sales of 23% in 2020, with - 14.8% in the first quarter, - 44.8% in the second, and - 26.9% in the third quarter (Naef, 2021). This is an extremely worrying result, given that the Euler Hermes Italy center predicted that with a 22% drop in turnover, the operating margins of most companies would be overdrawn, especially for those companies operating in the middle of the supply chain. The sector witnessed a slight recovery only in August and September, a period which coincided with loosened restrictive policies.

Fig. 5 – Evoluzione delle esportazioni verso la Cina per comparto (variazioni % tendenziali)

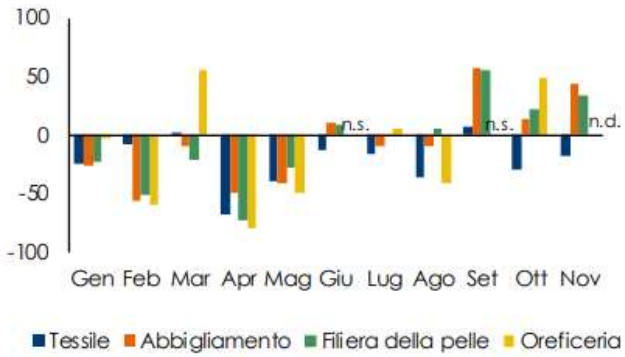


Fig. 6 – Evoluzione delle esportazioni verso la Cina nel periodo gennaio-novembre 2020 (variazioni % tendenziali)

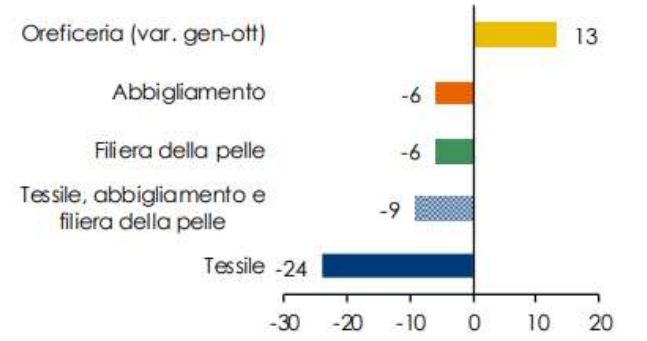


Fig. 36 – First graph shows the evolution of Italian fashion exports to China. Second graph shows focus of exports to China in the period January – November 2020. Source: Intesa San Paolo, 2021.

As soon as the pandemic reignited and the containment measures were tightened, the sector fell back in the final months of the year (Euler Hermes, 2020). A series of causes made the situation so drastic for the Italian fashion industry. The first consequences were perceived when China, the main exporter of fibers and fabrics entered a first lockdown period in February 2020; supply shortages then translated into exports reduction (-22%) (Euler Hermes, 2020). National lockdowns, on one hand, forced stores to remain closed and resulted in unsold goods, on the other hand, they led to the collapse of tourism, and travel retail, which is fundamental for cities such as Milan, Florence, and Venice (Mochi, 2020). To avoid financial distress, many Italian artisanal luxury suppliers switched to personal protection equipment production since they witnessed a drop in orders by 40% (McKinsey et Al. 2021). All this has also had an impact on employment levels. In an interview with Stefano Vittucci, EY partner and head of Consumer Products and Retail in Italy, for Andkronos (2021), stated that: "we had estimated an increase in unemployment between 30% in the base scenario and 38% in the most severe one. However, this estimate will certainly be influenced by further restrictions, which will be aggravated by the second lockdown". The impact on workers, however, is not just limited to the unemployment level, since, with the rise of digital relevance, firms' business models need renovation and workers need to adapt to the new skills required. Obviously, some types of workers are more exposed to this risk, especially lower-skilled ones such as retail salespeople (EY et Al. 2020). However, it is important to underline the ability of the Italian sector to promptly seize the potential of those markets where containment measures were most effective. In fact, during the summer months, Italian companies scored significant sales growth in China and Korea: +54% and +10% respectively September and October in China, and +11% and +7% in Korea. The Chinese market continued to represent a good source of revenues for Italian companies also in November so that the the final balance for the period January-November was only slightly negative (6%) (fig. 36) (Intesa SanPaolo, 2021). For the recovery of the sector, it will be fundamental to overcome the challenges posed by the new international scenario, relaunching investments and, at the same time, preserving the skills and "know-how" that have made the Italian fashion system competitive and unique. (Intesa SanPaolo, 2021).

3.3. WORKERS PAY THE HARSHER REPERCUSSIONS

Orders cancellations, financial distress, bankruptcies, are some words useful to describe objectively the impact that Covid had on the fashion system, but they might lead us on the wrong way. We might forget that this gigantic, global system is made up of people, and they are really suffering the consequences of the economic crisis. If we also consider the wide unbalances of the actual global system, the saddest thing is that the negative impacts are mainly localized in those countries where the consequences can realistically become tremendous. In fact, the huge demand shocks have had strong repercussions on the entire fashion supply chain, but particularly on those suppliers who have seen thousands of orders for finished or semi-finished products canceled. Inventory turnover fell by 33% in the first three months of 2020, and this negatively reflected backward towards suppliers, whose orders were down a third year-on-year by the end of April (McKinsey et Al. 2021). Given that many of these producers are located in countries with low labor costs, the consequences have affected millions of workers, expanding also at the social level. Western brands had reportedly canceled $2.8 billion of orders only from Bangladeshi suppliers, leaving manufacturers with liquidity shortages and difficulties in paying employees: this inevitably forced factory closures (ILO et Al. 2020), with some 9% of garment factories closing permanently and affected the livelihood of more than 2 million workers (McKinsey et Al., 2021). More than 1 million garment workers in the country have already been fired or furloughed because of the orders cancellations, with most sent home without wages, according to a report published by Mark Anner, director of Pennsylvania State University's Centre for Global Workers' Rights in association with the Worker Rights Consortium (Kent et Al. 2020). Bangladesh is just one of the countries severely affected by the fashion system collapse: all the fashion manufacturing hubs, such as India, Vietnam, Cambodia, Honduras, Ethiopia have paid dearly. We can confidently state that this pandemic has shown once again the inefficiencies and inequalities of, in general, our socio-economic system, and particularly of the fashion value chain. This is because of its unfair supply choices, which are driven by purely economic reasons, with poor attention towards the people that make the industry. Western companies indeed do not directly hire workers but only take advantage of the low cost of labor without taking any responsibility. As we saw previously through the double curve problem representation, supporting policies are needed to face and survive the restrictive measures but these countries are less likely to be able to access all the resources needed to provide aid packages like the ones deployed both in the U.S. and (Kent et Al. 2020). Western companies could then represent a major opportunity to overcome these issues but, on the contrary, the nature of relationships between western companies and third-party suppliers located in these countries is extremely harmful.

This pandemic has shown once again the inefficiencies and inequalities of, in general, our socio-economic system, and particularly of the fashion value chain.

Indeed, most brands and groups establish and maintain only transactional relationships with suppliers. These are ineffective and obsolete solutions since state-of-the-art business practices encourage intermediate solutions between arm-length transactions and vertical integration, particularly strategic alliances, joint projects in which firms cooperate, coordinate, and share information without losing their autonomy. Substituting undedicated market transactions with deeper and long-term relationships, contract incompleteness is more likely to be overcome, because partners rely on trust and reciprocity for what is not explicitly regulated by contracts (Lamastra, 2019). For example, information on workers' conditions and wages would be easier to share and control, resulting in higher protection of workers, and there would be mutual interest in making the business realities survive the hard times. As of today, there are only some companies that have begun to take partial responsibility and help suppliers face the economic crisis, for example by paying for orders that have already been produced. Anyway, to make the fashion industry fairer for workers, there is still a need for revolutionary changes at any level.

3.4. OPPORTUNITY TO DIGITALIZE

The compulsory closures of production and commercial activities in many areas forced consumers to turn to online purchases, resulting in a sharp increase in the percentage of purchases made during the pandemic period. As evidenced in Fig. 37 despite a gradual return to normalcy, the digital sphere is bound to become more frequent as a preferred channel, with a percentage increase in all major online shopping markets compared to the pre-covid period (McKinsey et Al., 2021). The migration to digital channels is also confirmed by what happened in China in May 2020, two months after the stores had reopened: revenues were still down 30% in department stores and 40% in fashion outlets, while online sales continued to grow (Gonzalo et Al. 2020).

Fig. 37 – Share of fashion sales from online channels, earlier recovery scenario. Source: Mckinsey et Al. 2021.

However, the fashion industry got off to a late start in developing the digital channels and to date, the "digital divide" is another dimension of strong polarization in the industry. The most dynamic companies see an e-commerce incidence on revenues of more than 10%, while others, including several Italian ones, are still stuck at 2 to 3% of revenues (EY et Al. 2020). A good overview of e-commerce is provided by Google's analysis that shows us the performance of e-commerce in the main markets (Google et Al., 2020)(Fig. 38)(Fig. 39). Although offline is still the preferred channel for consumers, many companies are beginning to renovate their network of physical stores and investments in digital. This is the case of Inditex, which in 2021 has decided to close at least 1200 stores worldwide to focus on digital growth (Casadei, 2020). It is also the case of Eastpack, which in 2019 introduced a new corporate strategy that aims at becoming a digital-first brand (Guolo, 2019). If we want to anticipate the future of e-commerce, once again we have to turn our attention to the Asian market, where lots of companies have already succeeded in blending the physical and the digital spheres, finding a new location for human interaction within the digital world.The phenomenon of Livestream commerce is a good example; it started in 2016 with the launch of Alibaba's Taobao Live and in three years, Chinese Livestream revenues amounted to $63 billion. The boom of Livestream aroused interest outside of China, and the US live streaming revenues are expected to reach $25 billion by 2023. Livestream commerce is also likely to accelerate in the next years since big tech firms and social media innovations are leading in a similar direction.

Fig. 38 – Share of fashion sales from online channels, earlier recovery scenario. Source: Google et Al. 2020

Fig. 39 – Comparison of emerging, growing, and mature e-commerce. Source: Google et Al. 2020.

In August 2020 Instagram introduced in-app checkout for Instagram Live and TikTok hosted its first shoppable Livestream. Other messaging apps are leveraging remote clienteling and proving valuable in supporting consumer purchasing decisions. From Japan's Line to Russia's Telegram, these apps provide marketing, customer service, and social commerce opportunities (McKinsey et Al., 2021).

Although offline is still the preferred channel for consumers, many companies are beginning to renovate their network of physical stores and investments in digital.

Marketplace, platforms, e-commerce are undoubtedly the buzzwords nowadays, and sometimes might be difficult to understand how to distinguish them. A digital platform is a digital space that connects two or more parties and where usually some exchanges happen. Marketplaces are nothing but an intermediate platform between sellers, who offer a good or a service, and buyers, who require and pay for what is desired (Fig. 40). The main advantage of these solutions lay in the immediacy of interaction between parties, streamlining considerably processes such as payments, providing wide access and quick delivery of goods, and even offering some digital value-adding experiences. These platforms are increasingly becoming the entry point of the fashion consumer customer journey (McKinsey et Al., 2019) and the reasons are many: they expand the variety of products, provide customers with superior convenience but also relevance, thanks to insight-driven marketing and seamless logistics and customer care (McKinsey et Al., 2018). As of writing, digital marketplaces have been putting more and more pressure on the entire fashion system year after year. Suffice it to say that Amazon has become the top apparel retailer in the U.S. with over 8% of the overall U.S. apparel market and Flipkart owns over 40% shares in India (McKinsey et Al. 2019).

Despite their unquestionable strengths, before the outbreak of the pandemic, a change in investor attitudes toward these companies was already happening. The euphoria around these topics brought in 2019 these companies to a 2x enterprise value – sales ratio (EV/Sales), compared with the 0.8x for the wider fashion industry. They have managed to raise almost half of the $3.7 billion collected from initial public offerings (IPOs) in fashion from 2018 to 2019; the odd thing is that the same firms account for just 17% by number (McKinsey et Al., 2020). Fashion-tech players are attracting a significant proportion of both private equity and venture capital investment: the proportion of this investment going to fashion-tech players, being their e-commerce platforms or direct-to-consumer brands, reached highs of 57% in 2019, scoring a marked increase from 28% of two years earlier (McKinsey et Al. 2020). Apart from these investments, we should consider the evaluation of fashion-tech unicorns, those privately-held companies that valued at least $1 billion: for example, StockX, Rent the Runaway, About You, and Allbirds. (Sundaram, 2019). As a matter of fact, fashion-tech companies resemble more purely tech companies, so following the rampant trend of Nasdaq, with continuously arising IPOs (Fig. 41).

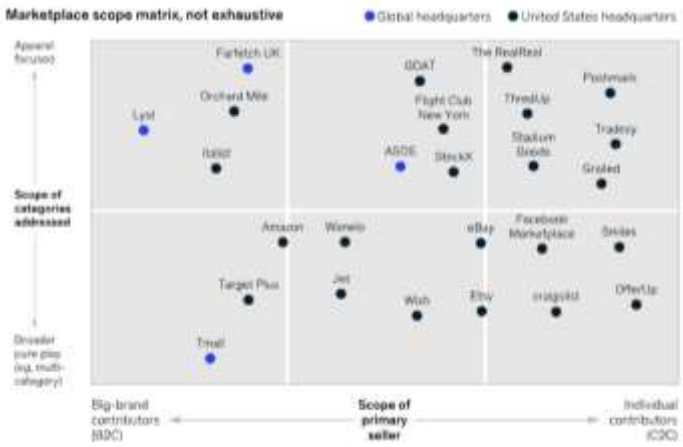


Fig. 40 – The landscape of digital marketplaces for the US consumer is crowded. Source: Briedis et Al. 2020.

Fig. 41 – Valuations of online retail players are significantly higher than traditional retail. Source: McKinsey et Al. 2019.

The problems occur since the performance of these firms is not as successful. Only 24% of companies are expected to report positive net income in their first year on the market, making them the least profitable IPO class of any year since the peak of the tech boom in 1999 (Wink et Al. 2019). E-commerce players consistently report lower profits than their physical counterparts: in 2017, average EBITDA margins were about 4%, compared with the 8% of traditional retailers. Hence, investors are not satisfied only with sales growth indexes, but need traces of profitability; the attitude of investors is changing, becoming more cautious to IPOs and ceasing extremely speculative behaviors. We expect in 2020 that the fever around these companies will abate, both in public and private markets, as investors look for signs of real profitability potential, over just sales growth. We expect investors to develop a sharper appreciation of which companies are creating value and which are destroying it, and a more sober attitude to IPOs (McKinsey et Al., 2020). Assuredly, the pandemic-related shutdowns and quarantine periods forced end users to turn to digital channels, and sales boosted from 16% to 29% globally in just 8 months (McKinsey et Al. 2021). Those who benefited the most have been exactly the pure marketplaces, since their business model is intrinsically stronger and more flexible to cope with an extreme situation, such as the pandemic. For example, Zalando saw its sales increase 39% in one year and Farfetch had a 74% increase in revenues in the second quarter of 2020 compared to the previous year. Other more "traditional" brands have struggled more, but still saw a 45% increase in flow to their websites in April compared to the previous month (Gonzalo et Al, 2020). Stock markets tell a similar story since marketplaces have proven to be more resilient than their traditional competitors: from January to October 2020, internet retailers have had on average 42% higher valuations than other listed fashion companies (McKinsey et Al. 2021). Despite the digital revolution is opening new radical opportunities, still, the fashion market remains quite mature as a competitive arena, and the overall context is increasingly chaotic. Competition is then tougher and tougher, even for these large e-commerce companies, that are starting to look for additional solutions to on one hand enhance the offer to the public, and on the other hand to improve their profitability.

One of the simplest concerns is the launch of private labels: Amazon did it in 2016, giving birth to seven in-house fashion labels which sell a very wide range of apparel and accessories for men, women, and children (Petroff, 2016). An alternative way to leverage the potential of platforms is the white-labeling: modular packages are offered that can include a flexible front-end suite of products, that comprise global websites and apps, or back-end infrastructure to help retailers and brands synchronize their online and offline inventory.

Pandemic-related shutdowns boosted digital sales from 16% to 29% globally, and those who benefited the most were the pure marketplaces thanks to their flexible business model.

Another strategy is to invest throughout the whole supply chain, trying to integrate new services and improve the experience for end customers. We can take as an example the Asian giant Alibaba, which has invested in payment solutions (Paytm, Kakaopay), logistics (XpressBees), and quantum computing cloud services (SenseTime) (Lectra, 2019). But it is not over yet, because fashion-tech companies can continuously leverage another huge source of advantage: data. Indeed, they are increasingly structuring themselves to better accommodate and manage the huge amount of data simply at their disposal. One of the most researched areas is artificial intelligence to develop systems able to turn large and diverse data sets into enriched information useful to improve the entire supply chain, from design and manufacturing to sales, marketing, and customer service (McKinsey et Al., 2018). AI can solve a critical problem of these platforms, the excess in offer. Customers face a vast amount of choices, which may result in a troubled customer journey and even cognitive dissonance. By analyzing the wide amount of data collected about each consumer individually, digital platforms can personalize the user experience by generating uncannily precise product search results, drawing attention to products which consumers might even have not realized they wanted, or again virtual storefronts that display information tailored to individual shopper's characteristics and preferences (McKinsey et Al. 2018).

A personalized and seamless customer journey leads to saving time and effort, and ultimately, create long-lasting customer loyalty and drive revenue growth of 10 to 30 % (Boudet et Al., 2017). In conclusion, these platforms continuously raise the level of service offered to customers, who now expect perfect functionalities and immediate support at all times. People are getting used to rapid delivery as digital players are constantly competing to ship products as quickly as possible; for example, the partnership between Farfetch and Gucci, which offers delivery in selected cities from the store to a customer's home in 90 minutes or less (McKinsey et Al. 2018). From the analysis of this scenario, it seems clear that collaborating with the online platforms is not an option anymore; rather, the question is how to do it in a way that is rewarding for both brands and platforms, considering the brand positioning and identity (McKinsey et Al. 2020). Marketplaces' advantages have been previously explored in detail but we would like to summarize them in a sentence: marketplaces offer support in implementing the omnichannel strategy of a company, offering access to new markets, channels, and services. Nevertheless, marketplaces and digital companies are getting stronger and stronger, so they may become a clear threat to the incumbents of the industry, especially due to their unique access to important customers data.

Collaborating with the online platforms is not an option anymore; rather, the question is how to do it in a way that is rewarding for both brands and platforms, considering the brand positioning and identity

3.5. NEW PEOPLE BEHAVIORS

We have already studied that the pandemic will certainly have an impact on fashion demand and consumption habits. We can try to foresee this evolution, by observing what has happened after previous crises. For example, during the SARS outbreak of 2002, China saw a fivefold increase in its rate of e-commerce penetration, and during the financial crisis of 2008, we witnessed a structural change in the retail world, with the spread of off-price apparel format, driven by more price-conscientious consumers (Bona et Al., 2020). Generally speaking, the companies that have acted promptly to adapt to the new changes have performed better in the following years. Considering again the 2008 crisis, among the companies in the S&P 500, those that invested in digital channels and marketing strategies targeting the new generation, have reported sales growth of about 6.5% more than those companies that reduced marketing spending (Bona et Al., 2020). Compared to the previous crisis, however, this one is not only financial, but it is primarily a sanitary emergency, characterized by periods of national quarantine, store closures, and social distancing. This crisis has occurred at a time when massive shifts in purchasing and media consumption were already occurring due to the technology disruptions of recent years. For these reasons it is believed that the impacts brought by this crisis will have much greater consequences on consumer behaviors if compared to the previous ones. Companies will act amplifying the impacts of marketers' responses and enabling winners to emerge more strongly and rapidly than ever before (Bona et Al., 2020). Regarding fashion, 88% of consumers expect a slow recovery or recession, and overall consumer confidence is low. As a result, consumer spending on fashion is also changing: more than 60% of consumers report spending less on fashion during the crisis, and approximately half expect that trend to continue when the crisis is over. However, consumers are likely to cut back on accessories, jewelry, and other discretionary categories before reducing their spending on apparel and footwear (Granskog et Al., 2020) (Fig. 42).

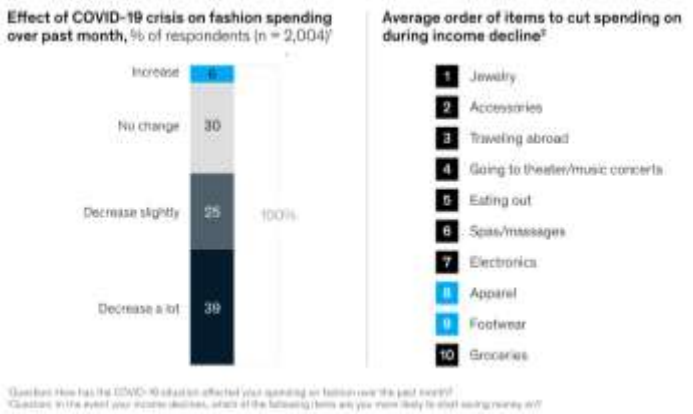


Fig. 42 – Main items that customer cut their spending on. Source: Granskog et Al., 2020.

A radical change from people's behavior point of view is the boom of remote working. Home workers are more likely to buy online and more interested in sustainable products

A radical change from people's behavior point of view is undoubtedly the boom of remote working. If it was an emergency solution during the pandemic, it is also true that for many workers this new modality will become a standard after the pandemic, even if only partially. According to the survey conducted by PwC, this will impact not only the future of the working world but also purchasing behavior. Indeed, home workers are more likely to buy online if compared to their counterparts who work outside the home. Not only that, according to this research, remote workers are more interested in sustainable products for example with a traceable origin and items with environmentally friendly packaging, all while spending less time in physical stores. (Pwc, 2021) (Fig. 43).

Fig. 43 –Preferences on purchase of workers working from home vs those who work away from home. Source: PwC,2021.

As time spent at home increases, so will spending on products geared toward at-home consumption: primary goods, and especially health and wellness products or services among the youth. At the same time, the spending on discretionary products dropped, mainly by delaying purchases of high-ticket items such as electronics, mobile devices, cars, and motorcycles (Bona et Al., 2020) (Fig. 44).
Thanks to the more flexible work environment and with the presence of remote working, what we will see is the continuation of the crisis of the formalwear category in favor of casual wear. The pandemic has also increased interest in health and wellness, and this will lead to an increase in demand for athleisure and activewear. This preference is also confirmed by investors; in October 2020 sportswear company stocks had exceeded their pre-crisis levels by 7%, while the non-sportswear clothing category was down 18%. (McKinsey et Al. 2021).
As introduced in the previous paragraphs, e-commerce is the winner of this new pandemic scenario. The COVID-19 crisis has recruited new consumers to online channels: 43% of surveyed consumers who didn't purchase fashion online before the crisis have started using online channels. And that shift is unlikely to reverse, as nearly 28% of consumers expect to buy less at physical stores—a trend seen in higher shares in Generation Z and millennial respondents (Granskog et Al., 2020)(Fig. 45). An interesting study was carried out by Adyen in Italy.

	Less than pre-outbreak	Similar to pre-outbreak	More than pre-outbreak
Media	Linear TV Out-of-home movies	Mobile gaming Social media News, books, and magazines	Streaming video PC and console gaming
Products	Alcohol Electronics and mobile devices Cars and motorcycles	Clothing and footwear	Packaged food and beverages Household products Health and personal care products
Retail channels	Casual restaurants (dine-in) Fast-food restaurants (dine-in) Department and clothing stores (in-store) Specialty stores (in-store)	Casual restaurants (off-premise) Fast-food restaurants (off-premise) Department and clothing stores (online) Specialty stores (online)	Grocery stores (in-store and online) Superstores (in-store and online) Online marketplaces
Services	Ride-/home-sharing apps Phone services Banking and insurance services	Delivery apps Lifestyle apps (e.g., dating)	Virtual classes Productivity apps (e.g., finance)

Fig. 44 –What Post-pandemic Gen Z and Millennials consumption will look alike. Source: Bona et Al., 2020.

Remote working will worsen the crisis of formalwear in favor of casual wear. The pandemic has also increased interest in health and wellness which will lead to an increase in demand for athleisure and activewear.

The first evidence is a confirmation of the increase in online purchases, with 37% stating that they purchased more during the pandemic and 37% that they will continue to choose online channels even after the pandemic. In particular, a sort of loyalty towards brands has developed, with half of the global consumers and 71% of Italian consumers indicating that they will continue to prefer the companies they trusted during the pandemic (Adyen, 2020). There are numerous examples of companies that have decided to help in the battle against the coronavirus. Among the first to take action is Giorgio Armani, who, after an initial donation of €2 million to the National Civil Protection Department and the Luigi Sacco, San Raffaele and Istituto Dei Tumori hospitals in Milan and Istituto Spallanzani in Rome, as well as donating to hospitals in the Tuscany region, that has announced that all of its manufacturing plants will switch from luxury goods creation to making single-use medical overalls.

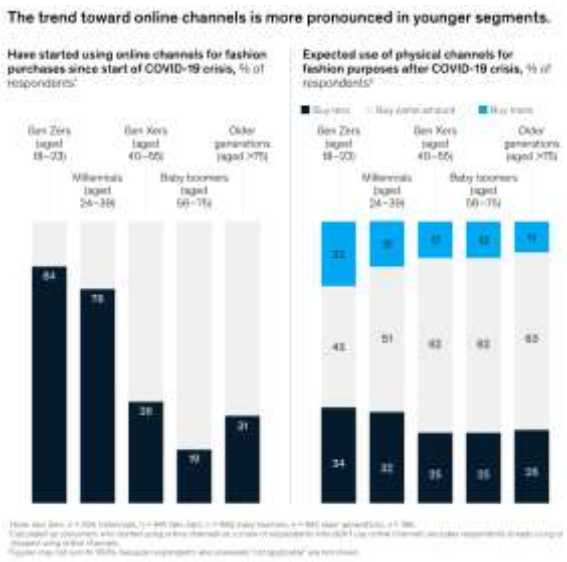


Fig. 45 – On the left is the beginning of the use of digital channels by the various generations, on the right expected use of physical channels. Source: Granskog et Al., 2020.

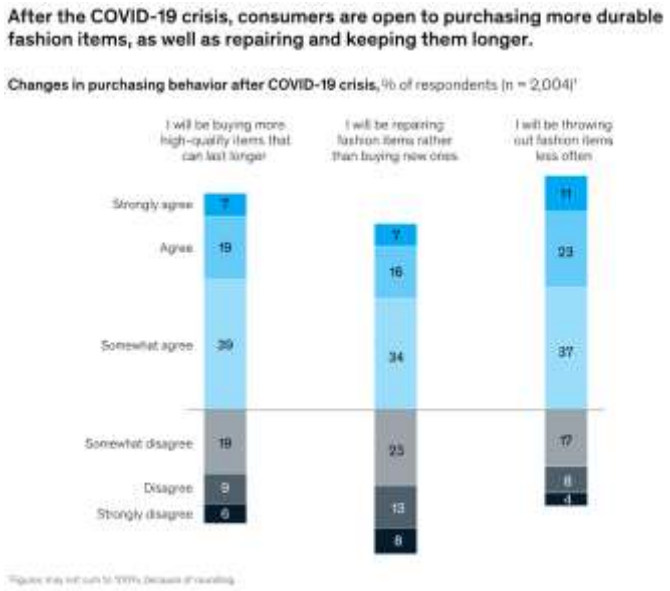


Fig. 46 –Change in purchasing behavior after Covid-19. Source: Granskog et Al., 2020.

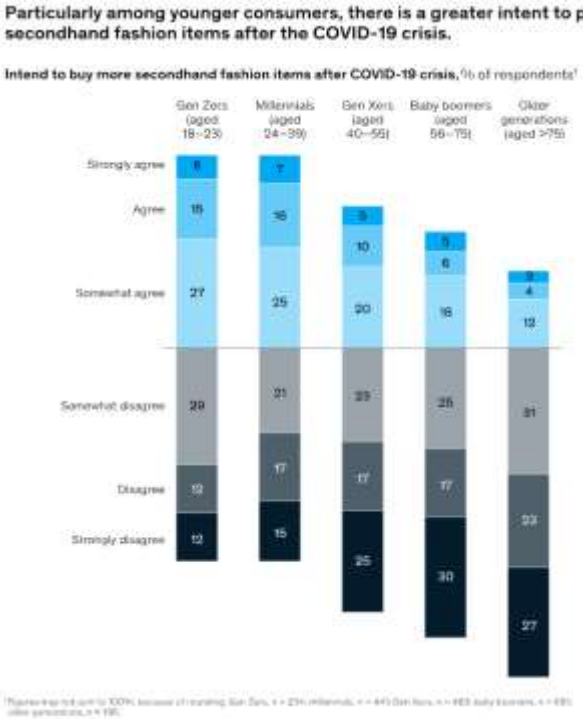


Fig. 47 – Intend to buy more secondhand fashion items after Covid-19, divided by different generations. Source: Granskog et Al., 2020.

Other overseas initiatives include that of Ralph Lauren Corporate foundation that has commited $10m to help those impacted by the coronavirus pandemic. In addition, RL has announced the production of 250,000 masks and 25,000 isolation gowns with its American manufacturing partners e il support a fundraising initiative in support of The Royal Marsden and other programs in support of NHS frontline workers. (Zak Maoui, 2020). The H&M Group has organized globally and to help combat the spread of the COVID-19 pandemic. It has reorganized its supply chain to produce personal protective equipment to be supplied to hospitals and healthcare workers. To deliver the material as soon as possible, the H&M Group will use its entire supply chain, including purchasing and logistics. Supply chain teams around the world are collaborating to support countries (Campaign, 2020). In short, these are just a few of the virtuous examples of companies that are committed to helping countries in the fight against this virus, and certainly, this commitment will have a positive effect on their image.

However, the most interesting fact is that according to Adyen, the pandemic "seems to have awakened social consciousness." 65% of Italians say they will shop more often at local retailers, to ward off their bankruptcy, and after the pandemic, they will reward those companies that support fair trade, with 71% of respondents in Italy preferring to buy from responsible, ethical merchants, with 62% preferring these environmentally and community-conscious businesses (Adyen, 2020). The focus on more sustainable models is also what emerges from Mckinsey surveys, were following the pandemic, 65% of respondents are planning to purchase more durable fashion items, and 71% are planning to keep the items they already have for longer. Additionally, 57% of respondents are willing to repair items to prolong usage. (Fig. 46). Particularly among younger European consumers, there is interest in purchasing secondhand fashion items following the COVID-19 crisis. Of surveyed consumers, around 50% of Gen Zers and millennials expect to purchase more items secondhand (Granskog et Al., 2020) (Fig. 47).

3.6. CONCLUSIONS

This chapter has shown the effects on the fashion industry of the combined supply and demand shock caused by the pandemic. The impact on the industry has been very strong and can be explained by the over-reliance on China for the early stages of the supply chain, as well as the discretionary nature of fashion products, which caused a reduction in spending. Only larger-scale suppliers with multinational footprint gained an advantage, whereas luxury brands managed to minimized the damages and will lead the recovery already in 2022. The difficulties in which many companies find themselves will certainly accelerate a trend that was already underway, that of Merge & Acquisition. This is a great opportunity for bigger companies since they will find significant market undervaluation to be exploited for inorganic growth strategies. Consequently this wave of M&A will increase the polarization of the sector. The focus on Italy allowed us to understand how district realities adapt to phenomena of great change. The Italian market was hit first by the blockade of the Chinese import market and then by national lockdowns. This has caused the elimination of luxury travel retail, which is particularly important given the segment that Italian companies target. However, the Italian market, thanks to its agile structure, managed to partially recover in the summer months, above all thanks to the growth of sales in Asian countries. Indeed, the companies that performed better had a large business relevance in the APAC region, since these are the countries that have shown the quickest recovery to the pandemic, as well as pure digital players, since they over-rely on the internet which has shown nothing but a boost because of the pandemic. Once the emergency period is over, the relevance gained by digital channels will persist, and this is an opportunity for companies to invest in digital channels and also rethink their network of physical stores.

Nevertheless, investing in your own channels is not enough. We have seen the growth of online platforms, which are increasingly becoming the entry point of the fashion consumer customer journey, thanks to the high service they offer, such as a wide choice of products, seamless logistics, and high customer care. Moreover, as the competition is getting tougher, these companies are investing in the whole supply chain, trying to integrate new services, raising the level of service offered to customers. Their structure allows them to access and analyze vast amounts of customer data, making them a clear threat to the incumbents. So companies must understand how to partner with them. They can help brands implement omnichannel strategies, offering access to new markets, channels, and services. We can confidently state that this pandemic has shown once again the inefficiencies and inequalities of our socio-economic system and in particularly the fashion system. The worst impacts have been felt by the last of the production chain, the workers. Given that many of these producers are located in countries with low labor costs, the consequences have affected millions of workers, expanding also at the social level. Order cancellations left manufacturers with liquidity shortages and difficulties in paying employees. Western companies have an opportunity to change this by acting on the relationships they have with third-party suppliers. For example, by establishing deeper and long-term relationships. All these could result in higher protection of workers, and here would be mutual interest in making the business realities survive the hard times. This crisis was a primarily sanitary crisis with quarantines, social distancing, and so on, and it occurred at a time when massive shifts in purchasing and media consumption were already occurring. The last paragraph was important because it allowed us to highlight the behavioral consequences brought about by this epidemic. Home workers are more inclined towards online purchases and greater attention to health, with activewear purchases. Thanks to the more flexible work environment, we will see is the continuation of the crisis of the formalwear category in favor of casual wear. In addition, the pandemic seems to have awakened social consciousness. For this reason, consumers will reward those companies that support fair trade, local activities, durable and second-hand items.

To conclude, we can say that the third chapter closes the overview of the fashion industry. In fact, in the first chapter, we presented the fashion industry and its main dynamics before the advent of the pandemic. In the second chapter, we told how the pandemic impacted the global economy and then we translated these impacts on the fashion industry to understand how they revolutionized the industry. Now we're ready to get into the heart of our elaboration and start covering one of the central topics... sustainability.

CHAPTER 4

UN SUSTAINABLE FASHION

In this chapter, we finally approach one of the central themes of our research: the sustainability of the fashion industry.
To address this topic, we first clarify what the term sustainability means, presenting its various declinations: environmental, social, cultural, and economic sustainability. As of today fashion industry is definitely unsustainable especially after the affirmation of the fast-fashion model and the unbalanced distribution of global value chains.
From the environmental point of view fashion is the second most polluting industry, impacting on emissions, water consumption and pollution, microplastics released and chemicals utilization. Regarding social sustainability, speed and competitiveness resulted in pure employment conditions, to the point that we talk about modern slavery and child labor. Cultural appropriation is an issue that gained visibility thanks to social media, reveling cases of plagiarism, exoticism and stereotyping. The major hurdle is to combine the these three perspectives with economic sustainability, which means offering affordable prices. Given the urgency of this topic, several reporting efforts have been made to evaluate the as-is situation of the industry: sustainable investments have increased sharply in recent years, though very often companies are involved in greenwashing and misleading adv. Large companies and especially giant sport players are the most sustainable, thanks primarly to the immense resource available for sustainable investments. In terms of activities, production, packaging and all the physical activities as well as transparency are unsatisfying. Only commitments and target setting are assessed positively, which highlights the gap between words and deeds. Further evidences come from the numeros international agreements and policies to counteract climate and social crisis such as Fashion Pact and 2030 Agenda for Sustainable Development, which introduced the widespread Sustainable Development Goals. Single companies have begun to adopt Corporate Social Responsibility which is the voluntary integration of social and environmental issue in business operation and relation, with a focus on shared value creation and societal progress. Companies also need to communicate to the final users the commitments; sustainability and ethic reports are increasingly adopted as well as third-party certification such as B-Corp. This chapter concludes with a presentation of the more sustainable business models, resale, rental and subscriptions, virtuous examples of alternative ways of doing fashion which break the current linear value chain and enable circular systems. This models are meeting a favourable environment due to shifting of consumer preferences as well as technological progresses.

KEY FINDINGS

1- From 2000 to 2015 global production has doubled while the utilization of a garments has decreased by 36%. At the moment less than 1% is involved in closed-loop recycling and 12% in open-loop

2- Fashion industry is accountable for: 4% of total GHG emissions, 70% of which coming from upstream activity, 44 trillion liters of water used, 35% of total microplastics released in ocean, over 15’000 different chemicals used and 26% of total plastics made

3- The UN describes modern slavery as the second-largest criminal industry in the world, with profits of over $ 150 billion. globally around 152 million children are engaged in child labor across sectors. Lack of transparency plays a key role since only 31% of brands disclose their entire global supply chain beyond the first level of production

4- sustainable investments have reached a record high of nearly $ 1.7 trillion by the end of 2020, but only 27% of companies publish information about the steps they're taking to reduce the amount of clothing and textile waste

5- only 19% of clothing disposal is due to real damages, whereas almost 70% are disposed of only for a matter of size and tastes

6- Subscription models in fashion have grown more than 100% in 5 years, and resale market will nearly triple within ten years reaching $ 64 billion

4.1. WHAT IS SUSTAINABILITY?

Sustainability has become a buzzword during the last decades and its relevance within our society is strengthening day by day; we would like to tell this as a wonderful story, ending with concrete and strong effort shared by people and companies all over the world, but unfortunately, sustainability is often used as a façade to attract and mislead consumers, especially in the fashion industry. The first inaccuracy about sustainability is that it is often referred to as environmental protection whereas it means much more. We can list at least four perspectives that should be taken into serious consideration when addressing sustainability, especially in business strategy terms. Note that the four views are equally important, and the order chosen to present them is just for writing reasons.
The first perspective is, as mentioned, the *environmental* one, which has already become a top priority for several industries and a lot of companies. To address this topic, companies need to forecast and eliminate possible adverse effects due to products, services, and processes: to list some, climate change, water footprint, emissions, environmental toxicity, land use, and biodiversity endangerment (Rossi et Al. 2021). The second perspective is *social sustainability*, which addresses instead all the issues linked to people and our modern society. A topic that is gaining more and more attention is the fairness of working conditions through health insurance, prevention in the working environments, and strict policies against child labor. Gender is another main topic, which encompasses equality in both wages and access to leadership roles; originally this topic was referred only to women but today it is woven with the wider topic of gender identity, affecting not only the employment policies of companies but also the products and services offered. We can generally interpret social sustainability then as the the effort of promoting a more inclusive society (McKinsey et Al. 2019).

The third dimension of sustainability is the *cultural* one, which differentiates itself from the social one, by focusing on respecting the multiethnic fabric of our modern society. To address this topic, companies must seriously preserve their original cultural roots and interact with other countries and cultures concerning differences or, better yet, by heightening these differences not in forms of a fight but indeed as a form of personal and societal growth (Boța-Moisin,2017).
Finally, economic sustainability. Wealth unequal distribution is getting worse and worse year after year, both at the regional level and within each country or city (United Nations, 2020). The convenience segments within each industry were born to address this problem, by offering low-priced products and services, coupled very often with low quality, though making products that are affordable for most people. The problem is that environmental sustainability requires processes and policies which increase, rather than decrease, the costs for companies, resulting in the so-called green premium, and making eco-friendly products often inaccessible (Fortune, 2021). If we talked about just a few categories of products, this problem would not be so relevant but since we need to radically reduce our whole impact, we need to find new solutions to enable environmentally and socially sustainable products to become also economically accessible to everyone.

Addressing sustainability does not mean using recycled packaging.
Addressing sustainability does not mean resorting partially to renewable energy sources.
Addressing sustainability does not mean avertising campaigns with black people.
Addressing sustainability does not mean printing labels with confused certifications.
Addressing sustainability does not mean clogging websites and social media with intentions to build a better world.
Addressing sustainability means instead reshaping companies' structure, strategy, and processes, from a zero-ground base; it means revaluating our set of priorities which drive decision-making processes and therefore commit to long-term prosperity for business, society, and the whole world.

4.2. FAST & GLOBAL FASHION: RECIPE FOR A DISASTER

Over the last 30 years, the fashion industry has undergone an evolution that has led it to become one of the least sustainable industries. To understand how it could reach this level, we should analyze two phenomena, the acceleration of design and the broadening of supply chains. The term *fast-fashion* was first used by the New York Times in 1989 to describe the mission of Zara, which claimed that it only took only 15 days for a garment to go from the design stage to being sold in stores (Maiti, 2020). The term "fast" was used to emphasize the main goal of this new (at that time) kind of business model in fashion, namely to have the shortest lead time to market, by designing, producing, and delivering as quickly as possible. Additionally, by exploiting huge economies of scale and by using low-quality raw materials, fast fashion companies have managed to profoundly reduce prices. Over the years these companies have structured themselves to be more and more agile and focused great efforts in collecting information about the latest trends and feedbacks from customers, to successfully couple short lead time with fashionable, updated, effective products.

FIGURE 1: GROWTH OF CLOTHING SALES AND DECLINE IN CLOTHING UTILISATION SINCE 2000

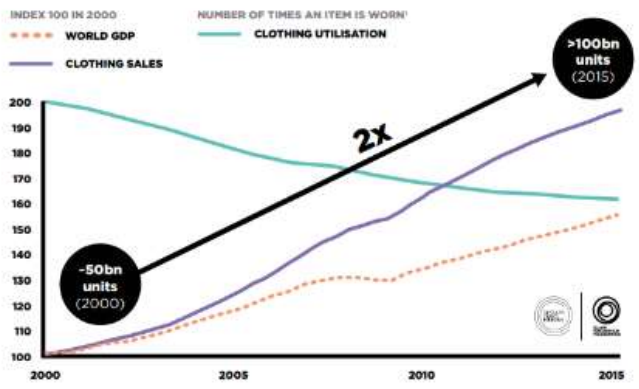


Fig. 48 – Growth of clothing sales and decline in clothing utilization since 2000. Source: UN Euromonitor, Source: Ellen MacArthur Foundation, 2017.

This has led to an increase in the number of collections launched, suffice it to say that European apparel companies have gone on average from 2 collections per year in 2000 to 5 in 2011 on average, with, for instance, Zara offering 24 new clothing collections each year, and H&M between 12 and 16 (Šajn, 2019). The breadth of products lines offered to consumers coupled with their low prices also provoked a change in consumers' attitudes, which is even deeper and more difficult to counteract: quickly buying a lot of products, wearing them fewer times, being aware that new products are always ready to substitute. From 2000 to 2015, the utilization of a garment, meaning the number of times it is worn, has decreased by 36%, and downright in China, it has decreased by 70% (Ellen MacArthur Foundation, 2017) (Fig. 48).

The fast-fashion business model only aims at being as effective as possible, by lowering time to market, and as efficient as possible, by cutting down production costs; this recipe, does not include in any way a focus on sustainability.

In terms of purchases, on average a US consumer purchases one mid-priced item of clothing per week (Common Objective, 2018), and in Europe, a 40% increase in clothing purchases was observed during the period 1996-2012 (Watson et Al. 2018). Additional data regards production, with the Global per-capita textile production which has risen from 5.9 to 13 kgs per year over the period 1975-2018 (Peters et Al. 2019), and if we consider the whole industry production, it has doubled over the period 2000-2015 (Ellen MacArthur Foundation,2017). Hence, the fast-fashion business model only aims at being as effective as possible, by lowering time to market, and as efficient as possible, by cutting down production costs; this recipe, does not include in any way a focus on sustainability issues (Niinimäki et Al. 2020).

The fast-fashion dynamics intertwine with another process that was already underway, namely the broadening of the global supply chain, according to which production is fragmented in different areas of the globe, depending on the competitive advantage sought in each country. It is interesting to have a brief look at how the fashion supply chain is structured and where the various activities are localized (Fig. 49). The first step of the fashion supply chain begins is fiber production; this phase ranges from the cultivation and all the processes to obtain natural fibers such as cotton, to the extraction of oil and the consequent manufacturing of chemicals, necessary to obtain synthetic materials, such as polyesters. Next comes yarn manufacturing, which involves a series of processes, such as spinning the fibers into yarn, knitting, weaving, or bonding the fibers in some other way to make the fabrics. The next phase is textile production, which begins with the finishing processes, whereby the fabric undergoes chemical or mechanical treatment to obtain the desired characteristics, for example, waterproofing. Once the textile is ready, after bleaching, dyeing, cutting, sewing, and being packaged, the product is shipped to the final customer or retail stores.

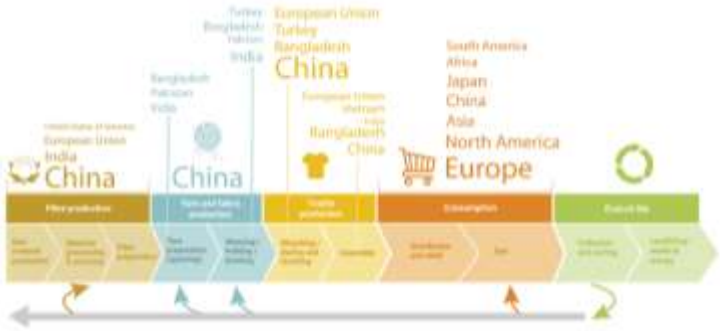


Fig. 49 –Geographical breakdown of global apparel production and consumption. Source: UN Environment Programme,2020.

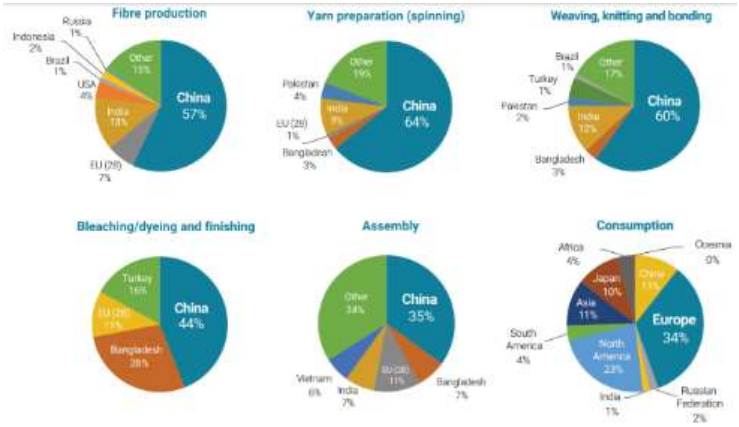


Fig. 50 – Production and consumption divided by shares. Source: UN Environment Programme,2020.

What we have described so far is the traditional and average supply chain of a fashion company, and sadly, it is also what the companies only take into consideration. They should instead consider that the *value* chain does not end with sales, but it implies other two major phases, namely the usage and end-of-life. Indeed, in the usage phase people wear the products, wash them, may need to repair or substitute their products, and, generally speaking, may need assistance. Once the product has no marginal value for the customers, the clothes reach end-of-life: products may be routed for a second-hand market, recycled (although at the moment less than 1% of products are recycled in new clothes whereas around 12% are used in other processes, such as insulation or mattress stuffing), or mainly enter incinerator plants and landfills (UN Environment Programme, 2020).

Now that we clarified a streamlined but quite comprehensive description of the fashion value chain, we aim now at studying the distribution of these stages throughout our world. The early stages are located in developing countries, which are characterized by cheaper labor and less stringent standards and regulations as it comes to social and environmental issues (Allwood et al. 2006). The raw material extraction and manufacturing stages are mainly carried out in Asia, and China is undoubtedly the industry leader, exporting $109.9 billion USD worth of textiles and $158.4 billion worth of clothing each year (Lu, 2018). China has indeed the highest share of the fiber, yarn, and fabric production stages, around 60% of the whole market, followed by India as the second biggest exporting country; these two countries, along with Indonesia, Bangladesh, and Pakistan, make the Asian continent be the largest producers of fibers, yarns, and fabrics by a substantial margin. As for dyeing and finishing activities, China is still the largest player but with Bangladesh, Turkey, and the European Union covering around 55% of the whole market; a further increase in dispersion comes with the assembly phase, where China shares on the market is “only” 35% and several other countries play a major role, although Asian countries still hold the majority of shares. It is thought-provoking to have a look at how the distribution of activities changes when it comes to the usage phase: Europe and North America hold the highest shares of the whole fashion market, with respectively 34% and 23%, whereas the Asian continent only counts for 22%, half of which is from China (UN Environment Programme,2020) (Fig. 50).

We can guess then easily that the global fashion value chain is unevenly distributed but we can strengthen this perception with a few more data from the 2020 report from Area Studi Mediobanca over the 80 largest fashion companies. Firstly, 68 companies have their headquarters in Europe (E.U. 38) or North America (N.A. 30), whereas in Asia we can find only 9 companies, 3 in South Africa and 0 in the rest of the countries. Looking at the revenues this imbalance gets even worse, with E.U. and N.A. accounting for 90% of the total revenues (Fig. 51). Looking at the supply data of these big companies, we get another confirmation that these major players extend their supply chain worldwide, and Asia plays the key role in supplying the whole industry, with 52% of Asian suppliers for E.U. based companies and even 78% for N.A. based ones. This holds especially true for sportswear and footwear manufacturers; for example, 90% of Nike's and Puma's suppliers are based in Asia (including Turkey) (Fig. 52).

Fig. 51 Localisation and revenues of the 80 leaders of fashion. Source: Area Studi Mediobanca, 2021.

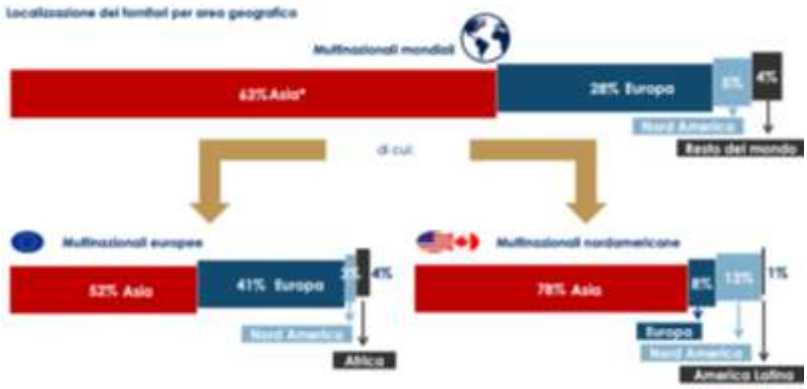


Fig. 52 –Localisation of the supplier of the global supply chain. Source: Area Studi Mediobanca, 2021.

Global value chain, driven by delocalization strategies with cost-reduction goals, coupled with fast-fashion market dynamics, drove the industry to an unbalanced situation: Europe and North America seize the main benefits, but the rest of the world is carrying the burden of excessive environmental and social costs.

To get more detail about how these companies operate, impressively 52% of these global groups are defined as no-factory companies, meaning they do not own production sites but outsource most of the production activities. The only activities that are usually kept in-house are design, prototyping, and supervision of the global chain of suppliers and, occasionally, also of the distribution network (Area Studi Mediobanca, 2021). We would like to specify that the supervision of supply and distribution network implies only the management of relationships and orders, but cannot enable real supervision on suppliers' factories, processes, and policies. Indeed, a global value chain may involve tenths, even hundreds of companies, from suppliers of second, third, and more order, to distributors that are spread throughout most countries in the world: it is quite evident that the headquarter of a brand is unable to supervise everything. To summarize our findings on this topic, we can state that the global dimension of the fashion value chain, driven initially by delocalization strategies with cost-reduction goals, coupled with fast-fashion market dynamics drove the industry towards a widely unbalanced situation: Europe and North America, by only hosting the headquarters of the most well-known fashion brands, seize the main benefits and wealth resulting from sales, but the rest of the world, mainly the Asian countries, are those who keep up the whole industry, performing the production activities needed but also carrying the burden of the excessive environmental and social costs of the whole industry.

4.3. ENVIRONMENTAL SUSTAINABILITY

The fashion industry is reported to be the second most polluting industry after oil (Charpail, 2017), and with over two billion people expected to join the middle class by 2030, actions to reduce the industry impacts are necessary, before the industry impact accelerates in an uncontrollable way (Fashion For Good et Al. 2020).

In terms of *emissions*, the fashion industry is extremely polluting. If we consider carbon dioxide, the most significant greenhouse gas contributing to human-induced global warming, on the current trajectory fashion industry is projected to contribute by 2050 to 25% of total emissions (Fashion For Good et Al. 2020). In 2018, it was responsible for 4% of total GHG emissions, amounting to around 2.1 billion tons; almost 70% of the fashion industry emissions came from upstream activities such as materials production, preparation, and processing, whereas the remaining 30% were associated with downstream retail operations, the use-phase (counting alone for 20%) and end-of-use activities. (McKinsey, Global Fashion Agenda, 2020) (Fig. 53).

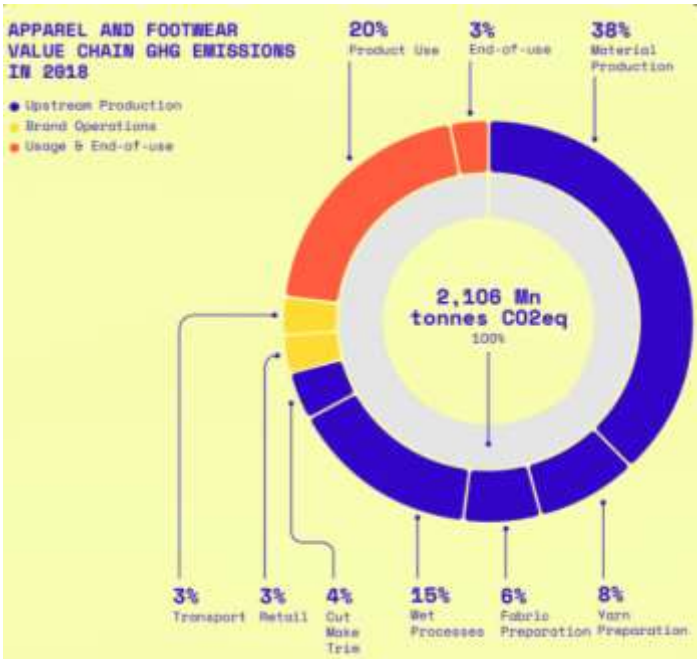


Fig. 53 – Apparel and footwear value chain GHG emission in 2018. Source: McKinsey & Global Fashion Agenda, 2020

The *carbon footprint* depends on the type of energy source that is used to power a business or operations, and China has a 40% higher carbon footprint than Europe and Turkey because it uses coal-based energy for the fashion industry (Weinzettel et Al. 2019). Despite a good percentage of brands, around 58%, publish information on the annual carbon emission of their owned facilities, only 16% of them also publish information on the annual carbon emissions produced by the whole supply chain; this data would be much more useful to understand the real impact since the upstream phases are those responsible for the highest proportions of carbon footprint (Fashion Revolution b, 2020).

Fashion industry is reported to be the second most polluting industry after oil. Actions are necessary, before the industry impact accelerates in an uncontrollable way.

Water is another resource highly exploited by the fashion industry. Water is crucial especially in the initial stages of producing a garment: to obtain primary resources through irrigation of fields, where 44 trillion liters of water are used annually (Gabi, 2018), and in the production phase, where it is used for various fabric treatments including bleaching, dyeing, printing, and finishing (Niinimäki et Al. 2020). It takes approximately 200 tons of water to produce only one ton of fabric (Anguelov, 2015). Though, the issue of water is not only limited to its immoderate consumption but also includes its pollution. The wide amount of chemicals used in the production phases may not be properly treated or disposed of, and end up polluting the groundwater, affecting often irreversibly ecosystems. If we take the case of Cambodia, the fashion industry alone, which accounts for 88% of the entire Cambodian manufacturing, caused an estimated 60% of water pollution and 34% of chemical pollution (Anguelov, 2015). Regarding water consumption, 52% of brands publish a company policy on water use, and 42% publish a supplier policy on water use. Furthermore, only 20% publish information about what the brand is doing to minimize the impact of microfibers (Fashion Revolution b, 2020).

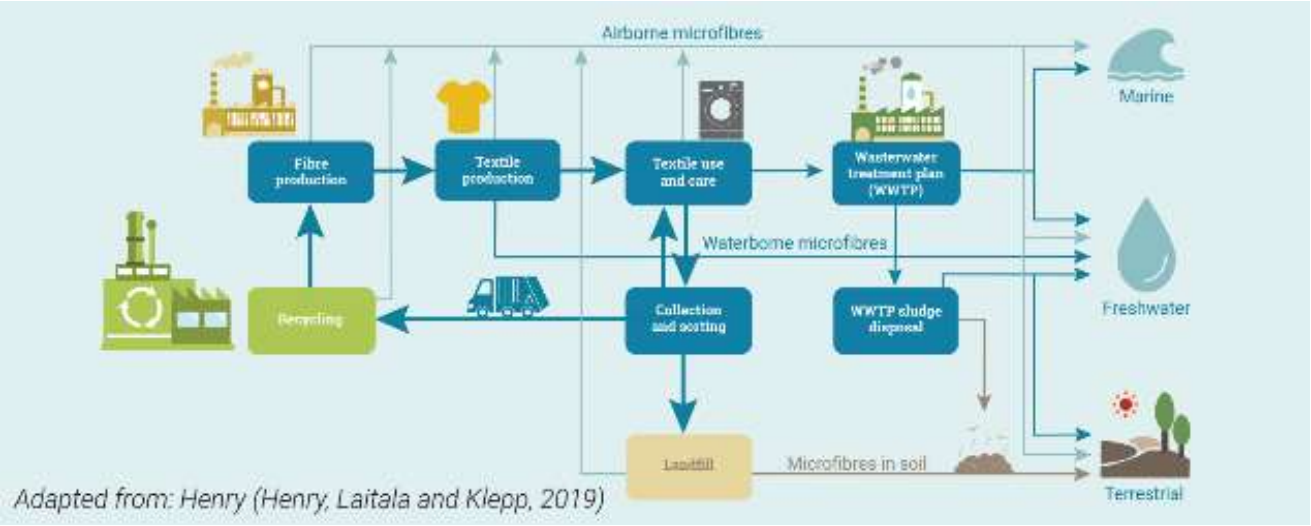


Fig. 54 – Major pathways of the release of microfibres in the textile value chain. Source: Henry et Al. 2019, adapted by UN Environment Programme, 2020

Another serious problem is the release of *microplastics* into the ocean, which are generated both in the production phase and in the usage phase when end-users wash garments, especially synthetic fibers such as polyester; while being washed, these garments release tiny fibers known as microplastics, which end up in the wastewater and eventually in rivers and oceans (Wagner, 2020) (Fig. 54). The fashion industry is the main source of the microplastics released in the ocean, being responsible for 35% of them (Wagner, 2020) (Fig. 55). These substances are seriously harmful because they are extremely slow to decay in the ocean, and when broken down, unleash a toxic substance, harmful for marine ecosystems. Apart from the tremendous impact over the aquatic ecosystems, being these microplastics so difficult to locate and remove, they end up back in the human food chain through aquatic forms of life, causing many negative effects also on humans' health (Le, 2020).

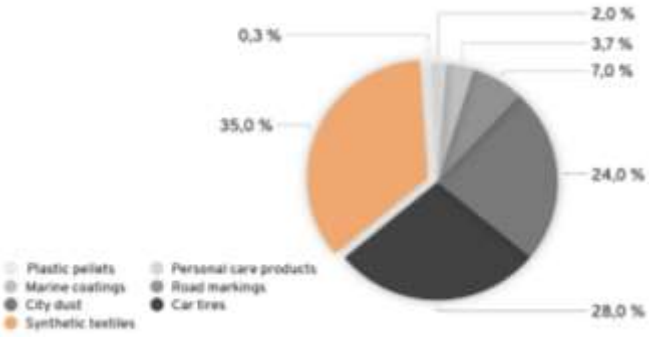


Fig. 55 – Percentage of the main contributor to the release of microplastic in water. Source: Boucher et Al. 2017, adapted by Wagner, 2020

Finally, *chemicals* represent another relevant threat to both terrestrial and freshwater ecosystems, since it is estimated that over 15'000 different chemicals are used during the production of fashion items (Roos et Al. 2019). The use of pesticides in the very initial stages has a direct impact on the environment, considering that these materials manage to penetrate the soil jeopardizing its fertility and biodiversity, and destroying microorganisms and insects (Pesticide Action Network UK, 2017). All these substances are dangerous also for people, who can experience nausea, diarrhea, cancers, and respiratory diseases (Reeves et Al. 2002); acute pesticide poisoning is responsible for nearly 1,000 deaths a day and afflicts neurological and reproductive problems, such as infertility, miscarriage and birth defects (Pesticide Action Network UK, 2017). Being the core of fashion garments production, China is inevitably also the largest consumer of chemicals used for textile, accounting for 42% of global consumption. Breaking down China's textile chemicals consumption, 41% are surfactants (including dye additives, antistatic agents, and softeners), 24% are sizing chemicals and 13% are lubricants (UNEP, 2013). Other treatments done along the value chain, such as bleaching and finishing, or the use of detergents and dyes represent also a risk in terms of carcinogenic human toxicity (Sandin et Al.2019). Not only are workers directly in contact with these substances, therefore, risk cancer, but another risk is related to the disposal since these substances are often discharged into rivers and contaminate freshwater rivers, with serious repercussions on local communities (UN Environment Programme, 2020).

Another threat arises from the use of *antibacterial agents* that are applied directly to fabrics to enhance their performance. One example is the use of fluoropolymers, which are applied to jackets to increase their water resistance. Traces of this substance have been found even in extremely remote areas such as the Arctic. These substances represent a high concern for the ecosystems since they can spread globally and bioaccumulate, meaning that they gradually increase their concentration in organisms; inevitably, the consequences are diseases, allergic reactions, and increased risk of cancer (KEMI Swedish Chemicals Agency, 2014). To realize how relevant the impact from suboptimal management of chemical substances is, the value opportunity of eliminating occupational illnesses by 2030 is estimated at €7 billion per year (Global Fashion Agenda et Al. 2017). But sadly, according to Fashion Revolution, only 24% of brands publish a time-bound commitment or roadmap towards eliminating the use of hazardous chemicals in products, and only 19% of brands are reporting progress towards achieving these goals (Fashion Revolution 2, 2020).

When assessing the environmental impact of fashion the following dimensions are to be taken into account: emissions and carbon footprint, water usage and pollution, microplastics release and chemicals utilization.

4.4. BREAKDOWN FOR VALUE CHAIN STEPS

Fig. 56 shows a diagram extremely useful, because it shows very clearly which areas of the industry are the most polluting, and we are going now through each of these phases to highlight the main problems.

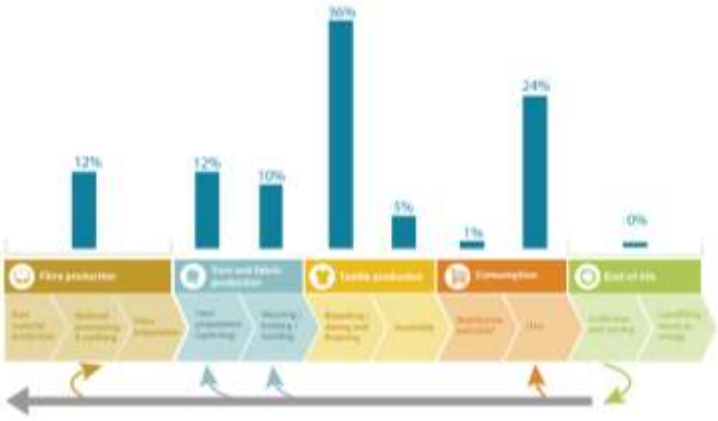


Fig. 56 –Contribution to pollution of the different phases of the value chain. Source: UN Environment Programme,2020

Design & Planning – The dominant lifecycle paradigm of almost any category of products, has always been linear, with products that are simply discarded at their end-of-life; of course, products and services are designed accordingly. Fashion items followed suit and the rise of fast fashion has taken this trend to extremes, with clothes made not to last long, but rather to quickly lose users' preference, end up in a landfill, and leave space for a new purchase, fueling demand to establish a vicious cycle. The product design and the development process itself has become as agile and fast as possible, to enable the continuous launch of new products and collections. While evaluating the impact of a product or a system, the design phase is often undervalued because it usually does not imply direct significant environmental costs.

On the contrary, the design and product development should be addressed in-depth, because their shadow is cast until the very end of the life of a product. It is during this phase that companies make key decisions that might generate unexpected impacts during the following phases: which materials to use and where to source them from, how skilled the labor force needs to be to realize a specific design, what kind of machinery is needed and which sources of energies are required accordingly, which manufacturing processes are best and where to build plants or factories, how inventory is stored and consequently needs to be managed, what will be the end-of-life whether the product will be discarded or recycled. In short, the decisions were taken during the design phase influence the whole lifecycle of a product and therefore may anticipate some of the environmental impacts. To give some numbers, compared to 5% of actual costs that the design phase directly implies, it influences 70% of the overall costs (Manufacturing Hub, 2019) (Fig. 57).

Fig. 57 – Comparison between cost impact and environmental impact of the different phases. Source: Manufacturing Hub, 2019

The design and product development should be addressed in-depth, because their shadow is cast until the very end of product life.
It is during this phase that companies make key decisions that might generate unexpected impacts during the following phases.

Not only does the initial phase influences more the next phases, with the so-called "cost impact" decision, but also the cost of changes follows an inverse dynamic, as shown in Fig. 58. It is crucial then to responsibly design products and processes, by adopting a lifecycle thinking approach, where decisions are assessed considering the whole lifecycle of a product; so, despite the little or no environmental impact that this initial design phase causes, companies that are responsible for these activities should address it very seriously (Monica Rossi et Al. 2021).

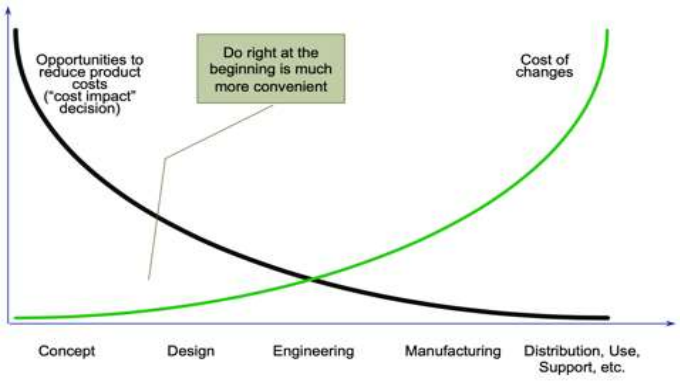


Fig. 58 – Comparison between the cost of changes and "cost impact decision" of the different phases. Source: Monica Rossi, 2021

Sourcing – The choice of raw materials to use inevitably influences a lot the environmental impact of a product. Various types of fibers can be used to make garments and the main classification distinguish natural fibers and chemical fibers. The former are those found in nature and can be further classified as a vegetable (cotton, linen, hemp, jute, etc.) animal (wool and silk), and mineral (glass fibers, metal fibers, asbestos, carbon fibers, etc.). The latter can be classified as artificial, if the raw material exists in nature but is not in the form of yarn and undergoes chemical treatment (cellulosic such as viscose and acetate or protein-like animal) and synthetic, coming from polymers of chemical synthesis from oil or coal (nylon, Teflon, gore-tex, lycra, etc.) (Fava, 2020). According to research conducted by Textile Exchange (2020), 52% of the fibers used are synthetic, while cotton comes in second place accounting for 23%, followed in turn by materials of a cellulosic nature (6.4%), and other natural materials such as wool and down (Fig. 59).
Cotton is cultivated in over 80 countries, occupying over 33 million hectares, around 2.5% of the cultivated land worldwide (Rinaldi et Al. 2013). About 80% of EU-consumed finished textiles are manufactured outside of the EU; likewise, some textiles labeled as being produced in the EU are imported as semi-finished textile materials from outside the EU and only finished locally. All this makes it difficult to calculate the overall impact of cotton and particularly the use of chemicals for its processing (Niinimäki et Al. 2020).

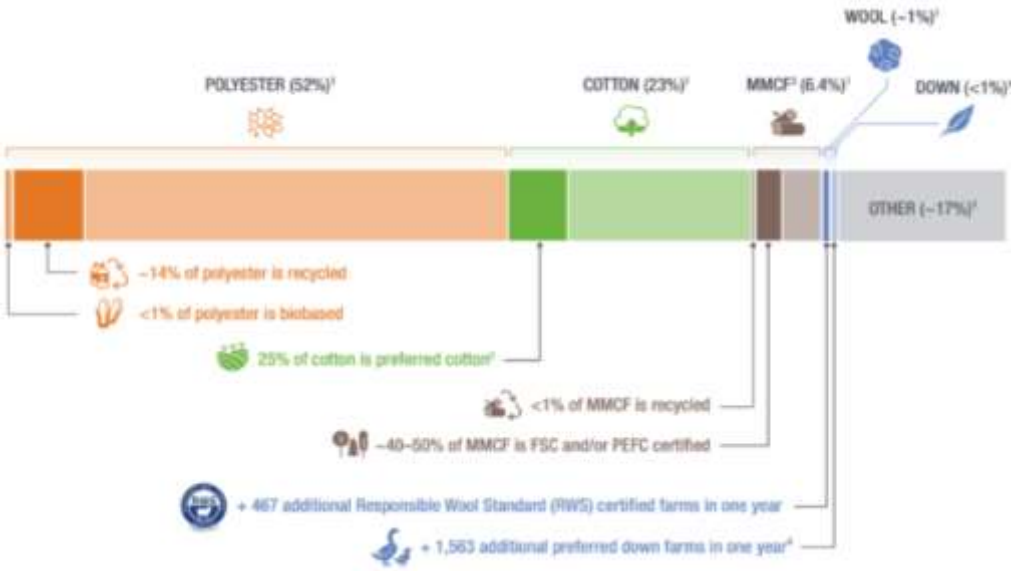


Fig. 59 – Main classification and percentage of use of different fibers. Source: Textile Exchange, 2020

This material turns out to be extremely polluting, considering 22.5% of insecticides and 10% of pesticides used worldwide are traceable back to cotton (Granskog et Al. 2020). Additionally, It is a water-intensive crop, as water is required to remove impurities, apply dyes and fixing agents, generate steam; it is estimated that it needs 2,700 liters of water to produce a cotton t-shirt (World Wild Life, 2014). There are also a few examples that show how damaging the production of this material is. The most famous case is the drying up of the Aral Lake in the Karakalpakstam territory, a lake that was used to irrigate cotton farms and has been reduced by 85%. The effects are also perceived by the population, since fishing was the main source of income, and has been devastated by lake shrinkage, reducing a large part in poverty. Moreover, when water evaporates, toxic dust clouds bloom: pp to half of the deaths in the region are attributable to respiratory illness caused by exposure to pesticide-laden dust. One in every 20 children is born with an abnormality, and the rate of genetic mutation in some groups is 3.5 times higher than the normal rate (Trent, 2020). Because of these impacts, in recent years the use of more sustainable solutions such as bio cotton, which requires less water and reduces the overall pollution, is becoming more widespread. According to a Textile Exchange report, the share of sustainable cotton increased from 6% in 2012 to 2013 to 19% in 2016 to 2017 (Šajn, 2019). Alternative materials are *wood-based natural fibers* and *man-made cellulosic fibers (MMCFs),* both obtained from cellulose derivation and therefore mainly from wood, and which account for 6% of all materials used by the industry. Every year more than 150 million trees are felled to obtain this material (Canopy, 2020), and it is estimated that 30% comes from endangered and primary forests, while the rest is obtained from tree plantations; water and soil pollution from chemicals used in forests plantation and during pulp processing drive habitat loss and endangered species (Granskog et Al. 2020). Another natural material is *wool*; with its annual production volume of more than one million mt, it is the most widely used animal-based fiber (Textile Exchange, 2020). This material can be obtained from different animals such as sheep, or some breeds of goat, Mohair, and Cashmere the best known, or even from other animals such as Alpaca. Among natural fibers, wool has the highest land footprints, requiring 278 hectares per ton of fiber, compared with just over 1 hectare per ton of cotton (Canopy, 2019). In its production, most of the pollution is caused by the greenhouse gas emissions producing in the order of 50% of the total emissions. The dominant greenhouse gas is methane which is emitted as a by-product of the natural digestive process that enables sheep and other ruminant animals to thrive on grasses that provide insufficient nutrition for most animals (Henry, 2016). For animal fibers, recycling and fair-trade initiatives have proved to have a positive impact on land use (Textile Exchange, 2018). *Synthetic fabrics* are often seen as a valid alternative because improved product durability and production require fewer resources. On the other hand, the non-renewable nature and low biodegradability create several problems in terms of disposal (Rinaldi et Al. 2013). Among these kinds of fabrics, the most used is Polyester (52.2%) followed by Polyamide (5%), such as nylon and person (Textile Exchange, 2020). Polyester consists of polyethylene terephthalate (PET), of which the basic materials are petroleum, hard coal, limestone, and natural gas. The production of polyester requires 98 million tons of crude petroleum every year, which currently corresponds to about 1% of the oil produced worldwide. If the fashion industry remains on this course, consumption could rise to 300 million tonnes of oil by 2050 and would be responsible for 26 % of human CO2 emissions by 2050. Overall, the production of polyester emits three times more CO2 than the production of cotton, 6 and 2 kgs CO2 per t-shirt respectively (Wagner, 2020).

Different fibers have different impacts on the environment. Natural fibers require less energy but more water during production and have a lower carbon footprint compared to synthetic fibers; this is partially offset during the usage phase due to high energy requirements for washing, drying, and ironing of natural fibers

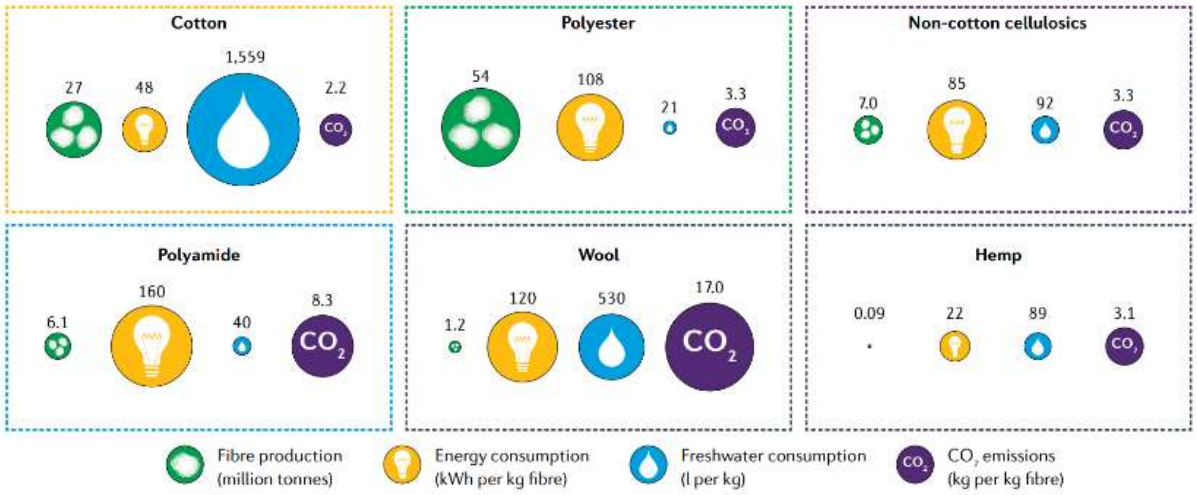


Fig. 60 – Environmental impacts of six types of fibers. Source: Niinimäki et Al. 2020

Its main advantages are that, unlike cotton, it has a lower water footprint, has to be washed at lower temperatures, dries quickly and hardly needs ironing, and it can be recycled into new fibers. Recycled polyester, made mainly from plastic bottles, increased its market share from 8% in 2007 to 14% in 2017. However, several studies have recently also shown that one load of laundry of polyester clothes (also nylon and acrylic) can discharge 700 000 microplastic fibers, which release toxins into the environment and can end up in the human food chain. Estimates show that every year approximately half a million tons of plastic microfibers end up in the ocean from washing clothes (Šajn, 2019). Despite the contrasting signals, polyester dominates production due to its performance characteristics and cost-efficiency and is projected to increase further as consumers in emerging Asian and African economies begin to adopt Western lifestyles and dress (Niinimäki et Al. 2020).

What can be seen from the summary chart in Fig. 60, is that different fibers have different impacts on the environment. Natural fibers (cotton, non-cotton cellulosic, wool, and hemp) require less energy but more water during production and have a lower carbon footprint compared to synthetic fibers (polyester and polyamide); this is partially offset during the usage phase due to high energy requirements for washing, drying, and ironing of natural fibers (Niinimäki et Al. 2020).

Processing & Manufacturing -- During the *production phase*, the resource that is mostly used is water, which is exploited in several ways. The problem is that during these processes water becomes dirty with wax and chemicals, and given the cost of treating dirty water, many times it is dispersed into the environment without undergoing any type of treatment, contaminating groundwater and the environment.

Dyeing is an operation that can be done at almost any stage, from the fiber to the final product, and may require whitening pre-treatment (Ruskino 2007). It can require up to 150 liters of water per kilogram of fabric and, in developing countries, where most of the production takes place and where environmental legislation is not as strict as in the EU, the wastewater is often discharged unfiltered into waterways (Global Fashion Agenda et Al. 2017). Dyes and printing inks require a pigment and a fixative, or mordant, both of which can be made from toxic chemicals and heavy metals such as lead, cadmium, mercury, and chromium (VI), known to be highly toxic due to their irreversible bioaccumulative effects, whilst azo dyes contain carcinogenic amines (Greenpeace, 2018). Azo group chemicals, which release carcinogenic arylamines, are widely used in synthetic dyes and pigments. Dyes are difficult to remove from wastewater and leave it colored, preventing wastewater from supporting plant life, by inhibiting aquatic plants' ability to photosynthesize.

Eco-friendly alternative colors exist and include low-impact and natural dyes that use nontoxic mordants, water-based inks, color-grown cotton, and wool fibers, although the color-grown palettes are often muted and limited (Challa 2014). Finishing occurs after the fabric is made and implies the application of chemicals to the fabric to enhance its properties. This process often requires water for the application and to wash out the excess finish. Many finishing processes have already been redesigned to use and contaminate less water. Make-up, also known as cut-make-trim, involves cutting the garment pattern out of fabric, sewing it together, and then adding any trim or embellishments. A major problem of this phase is the textile waste that is generated, which depends on the type of product to be made, the material itself, and the treatment chosen. For example, the waste material for pants is on average 10% but can grow for other products such as blouses, jackets, and underwear (Niinimäki et Al. 2020), reaching highs of 47 % (Runnel et Al. 2017). By eliminating waste in the overall process, the product manufacturing sustainability can be increased remarkably (Islam et al. 2014).

Packaging – Packaging is a necessary part of the product, both to protect it from any form of damage during transportations and to present the product information. Usually, the products used during packaging are petroleum-based materials such as plastic and it's estimated that plastic packaging is about 26% of the total volume of plastics created a year, and 72% of this is thrown away (Ellen MacArthur Foundation, 2017). The fashion industry, which has always made extensive use of these solutions throughout the supply chain, from polybags in factories to plastic carrier bags in stores, has seen an increase in its use since the boom in digital channels, thanks to online orders and returns policies. Recently very stringent norms have been introduced, such as the European Packaging and Packaging waste directive 94/62/EC which deals with packaging waste problems and the use of heavy metals. Companies carrying out environmentally friendly actions are seeking to reduce their carbon footprint by using packaging materials recycled and compostable, natural, and produced without any chemicals added (Topral et Al. 2017). Not only do companies need to take action to reduce the amount of packaging they use in their processes, but they need to engage consumers with initiatives that can educate and raise awareness about this issue, reinventing the role of packaging and lengthening its lifecycle.

During the production phase, the resource that is mostly used is water which is polluted with toxic chemicals. Another major problem is the textile waste, which ranges from 10% to 47%. Moreover, fashion packaging contributes with 26% of total plastic volume created worldwide. Fashion items distribution is causing increasing emissions due to the global dimension and need for quick transportation means.

Distribution & Retail -- Products are often manufactured outside the borders within which they are sold, with a large part of production in Asian countries. Despite this, distribution and retail contribute only 1% to the climate impact of global apparel. In part, this figure is undervalued by the tremendous results of other areas of the supply chain. It is important to underline that apparel is usually transported to Western countries by container boats, but more and more often, given the growing importance of speed dictated by fast fashion, we see the use of solutions such as air cargo. Resorting to this solution leads to a 35% increase in carbon emissions (Quantis, 2018). In recent years, substantial attention has also been given to a type of pre-consumer waste called deadstock, which is new, unworn garments that are unsold (or returned, especially after being bought online) and 'designated as waste'. In 2016, for instance, Ecotextile News reported that only a third of all imported clothing in the EU is sold at full retail price, a third is sold at a discounted price and a third is not sold at all (Mathews, 2016). Two cases in 2018 shed additional light on deadstock: Swedish fast-fashion brand H&M was reported to hold $ 4.3 billion worth of unsold inventory in warehouses and luxury brand Burberry was reported to have incinerated £ 90 million worth of unsold inventory over five years as of June 2018 (BBC News, 2018), £ 28.6 million worth was incinerated only in 2017 (Reints, 2018).

Usage -- With usage we mean the processes that customers do when they own the product, particularly wearing, washing, and disposing of. A study shows that average UK washing habits release at least 9.4 trillion microfibers per week into the environment and use up to 130 liters of water per wash (Environmental audit committee, 2019). The report conducted by Jrc, therefore, concluded that one of the most efficient ways to reduce the environmental impact of clothes is to persuade consumers to make small behavioral changes, such as reducing washing temperature, washing at full load, avoiding tumble-drying, purchasing eco-friendly fibers, and donating clothes that are no longer used. Consumers can also lower the environmental impact of their garments by washing their clothes less frequently (and airing them instead) and avoiding unnecessary ironing (Beton et Al. 2014).

End – of – life -- Fast fashion has led to an underutilization of garments, shortening their useful life and increasing consumption, and consumers often find themselves throwing away garments that could still be worn; annually this cost is estimated to be $460 billion (Ellen MacArthur Foundation,2017). This led to a 40% increase in landfilled textile waste in the USA between 1999 and 2009 (Office solid waste, 2010), and globally, textiles account for up to 22% of mixed waste (Norup et Al. 2019). The countries producing the most trash are U.S. and UK, with 30 kgs per person (Allwood et Al. 2006), followed by Australia, with 27 kgs, Finland and Denmark, with 13 kgs and 16 kgs respectively (Dahlb et Al.2015; Watson et Al. 2014). Alternatives to landfills could be recycling or re-use, both facing several difficulties to establish as a valid alternative. Recycling faces several difficulties. One issue relates to the take-back of used clothing, with take-back rates varying widely between countries, for example in Italy it is 11% while in Germany it is 75%, but it should be noted that some countries do not have any take-back system (European Cities, 2018). A challenge in recycling concerns the lack of adequate technologies to separate blended fibers, and fibers from chemicals, even establishing which chemicals were used in the production in the first place, which is the main reason why it is easier to recycle owned factory waste (Šajn, 2019). In addition to these mechanical processes that undergo in the recycling stage, the clothes are cut up and shredded, which means that the fibers are shorter, of lower quality, losing around 75 % of their value (Šajn, 2019). A closed-loop cycle is far from reality, and clothes are not recycled into new garments but are used for lower value products such as cleaning cloths and insulation. In figures, just 13% of the fiber input for clothing is recycled and less than 1% is closed-loop recycling (Ellen MacArthur Foundation, 2017) (Fig. 61). Smaller recycling loops are more environmentally beneficial than larger loops: recycling back to fabrics has the potential to avoid both the production of raw materials, and the subsequent fiber, yarn, and fabric processing, whereas recycling back to fiber only avoids the production of raw materials. Another consideration is the energy requested for recycling, which may offset the benefit of recycling loops, especially the larger ones. However, recycling cotton fabrics back to raw fiber can potentially reduce the water footprint by 90%, since raw material production accounts for a significant majority of the water used (Roos et Al. 2019). Today 30% of brands offer to customers a permanent, year-round clothing take-back and in-store recycling system, and only 16% of brands offer repairing services to help extend the life of their products (Fashion Revolution b, 2020).

Usage impacts are mainly due to washing processes that release microfibers and use water. As for the end-of-life the worrying issue is the landfilled textile which globally accounts for up to 22% of mixed waste; alternatives could be recycling and reuse. Actual recycling technologies are energy-consuming and deteriorate fibers causing a loss of 75% of their value.

To conclude this long journey through the value chain and its wide negative environmental impacts, it becomes critical for industries to take action quickly; otherwise, their margins could fall by up to 3% by 2030 due to rising costs of raw materials, energy, and labor, which will lead to a loss of approximately €45 billion per year in industry profits (Boston Consulting Group, 2017) (Fig. 62).

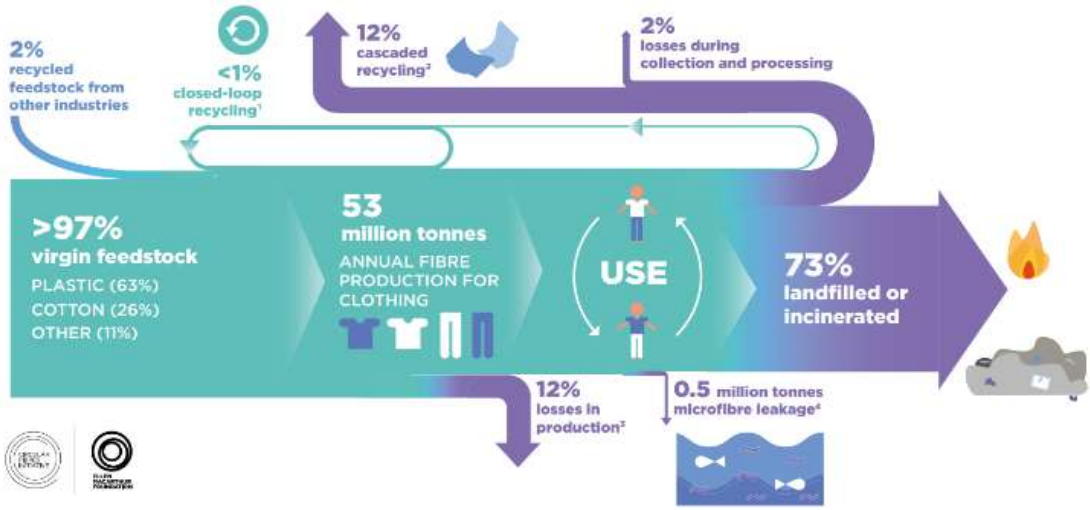


Fig. 61 – Global material flow clothing in 2015. Source: Ellen MacArthur Foundation, 2017.

Fig. 62 – Comparison of the actual margin of 2015 to the one of 2030 with rising raw materials, energy, and labor costs. Source: Boston Consulting Group, 2017

4.5. SOCIAL SUSTAINABILITY

As it has been shown, the dominant business model that has emerged in fashion is based on the offshoring of production in countries such as Africa and the Middle East, where supply is greater than demand. The drive to keep up with the speed and competitiveness of the market has resulted in poor employment conditions in different parts of the supply chain, both in Europe and Asia (Manshoven et Al. 2019). Often companies themselves do not capture the details of their own textile supply chain. According to the report conducted by Fashion Revolution (2020), only 31% of brands disclose their entire global supply chain beyond the first level of production. Combating this system, however, is extremely difficult because the fashion industry is extremely complex. As Mark Sunmer says in an interview with Emily Sutherland for Drapers (2020), "Fashion is an industry of industries: it is very closely connected to agriculture for the production of raw materials such as cotton, to the chemical industry for dyes and to the garment-manufacturing industry in a vast array of developed and developing nations. A garment could have been through five different countries, all with different legislation … With that level of complexity, it shouldn't be surprising that there are issues." Often entire families are involved in these jobs and, since they depend solely on this work, they are willing to accept precarious working conditions.

Fig. 63 – Comparison between living wage and minimum wage. Source: Clean Clothes, 2017

Even the salary is not adequate, as the minimum wage can be only one-fifth of the living wage, with living wage meaning the salary that would allow someone to meet the primary necessities such as food, health, home. Fig. 63 gives us a fair overview of wages in different regions of the world (Clean Clothes, 2017). To compensate for their low wages, workers are forced to have extremely long shifts, averaging 14-16 hours (Charpail, 2017), to the point that it is described by the term *modern slavery*. Even though there is no formal definition, is meant to indicate precisely all those workers who are forced to work under these precarious conditions. The UN describes modern slavery as the second-largest criminal industry in the world, with profits of over $ 150 billion (Davis, 2020).

The pressure to keep up with the speed and competitiveness of the market has resulted in poor employment conditions in different parts of the supply chain, both in Europe and Asia. Often companies themselves do not capture the details of their own supply chain.

The Global Slavery index estimates 40 million people are living in modern slavery today, many of whom are in the Global South working in the supply chains of western clothing brands. G20 countries imported $ 127.7 billion in fashion garments identified as products at-risk of modern slavery (Freitas, 2019). Furthermore, this is not just an issue in Asian countries. Nicholas estimates that there are 130,000 modern slaves in the United Kingdom, a whopping 100,000-400,000 in the United States, and a range between 1,400-15,000 in Australia as of today. Fashion's most recent controversies have been fortunately started disturbing the spread of modern slavery. One of the latest scandals involves the UK e-tailer Boohoo, who faced allegations of misconduct after a Sunday Times reporter posed as a worker in a factory in Leicester, UK. Claims include that workers at that factory were suffering severe forms of underpayment, worked excessive hours, had their passports taken away, and were even forced to come to work while COVID-19 infections surged within the factory (Davis, 2020).

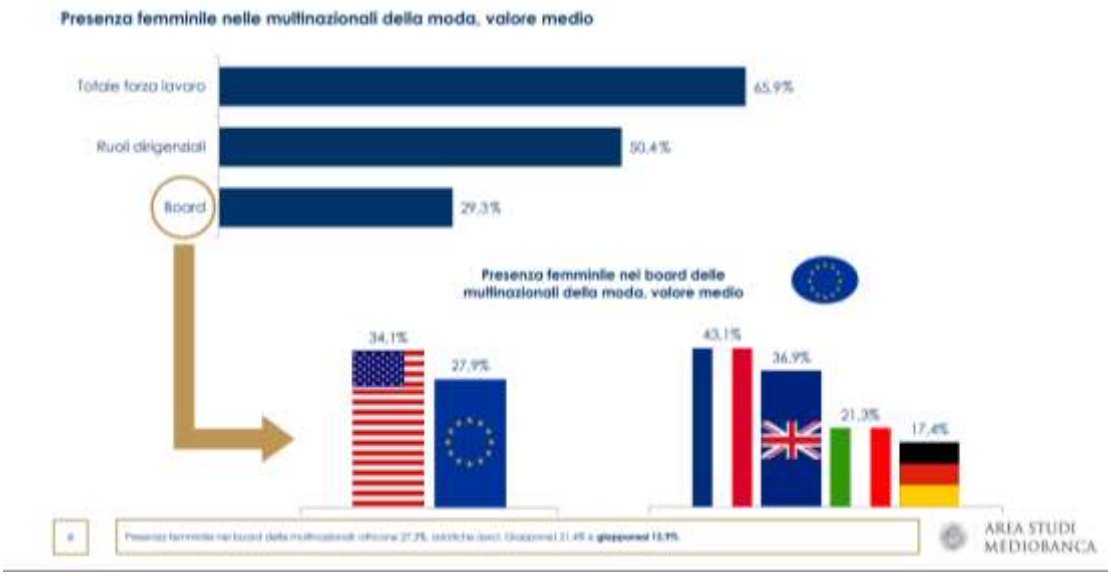


Fig. 64 – Working force of women in the fashion industry. Source: Area Studi Mediobanca, 2021

In addition, since the work required is often low-skilled, an even frustrating issue is child labor. The International Labour Organization (ILO) (2018) estimates that globally around 152 million children are engaged in child labor across sectors. 71 % of the global child labor force is attributed to the agricultural sector, which includes cotton widely used by fashion. Children's work is opportunistically preferred in cotton picking, for their small fingers do not damage the crop. As a matter of fact, children work at almost all stages of the fashion supply chain; from the production of cotton seeds in Benin, harvesting in Uzbekistan, yarn spinning in India, right through to the different phases of putting garments together in factories across Bangladesh (Moulds, 2021). Another of the major issues that need to be addressed involves the unsafe conditions in which workers are often forced to work. Since the tragic 2013 event at Rana Plaza in Bangladesh, when a structure collapse caused 1134 workers to die and more than 2500 injured (most of them were women and young girls), there have been improvements to the facilities, but serious incidents continue to happen. In December 2019, a large fire swept through a bag factory in the Indian capital Delhi killed 43 workers who were sleeping inside the building.

On 13 February 2020, a fire killed seven people working in a denim factory in Ahmedabad, India, in which the only safe exit was by climbing up a steep ladder to just one exit door. Less than two weeks later, on 24 February another fire killed three people in the same city (Fashion revolution a, 2020). Last but of course equally important is gender equality, which needs to be addressed more seriously in the fashion world. If we consider the workers of the largest fashion groups, women on average account for 65.9% of the total, while the number of women employed in management positions declines to 50.4% and those represented on the Boards of Directors reduces further to 29.3%. If we focus on Board positions only, there is a significant difference between countries: women account for 34.1% of the total in companies based in the U.S., and only 27.9% in European-based firms. Looking at Europe in more detail, female representation on corporate boards is above average for French groups and companies based in the United Kingdom (43.1% and 36.9% of the total respectively), but lower than average for the Italian and German firms (21.3% and 17.4% of the total respectively). Last of all comes the Japanese groups, in which on average around one out of ten Board members is a woman (Area Studi Mediobanca) (Fig. 64).

4.6. CULTURAL SUSTAINABILITY

In the fashion world, cultural appropriation is a topic that has emerged especially in recent years. This can be partly explained by the fact that often cultural appropriation was concealed and justified as inspiration rather than outright plagiarism. Precisely for this reason, we believe that before trying to give a formal definition, it is useful to propose some of the best-known examples, to better understand this topic. The first example is an affair that happened to the French brand Isabel Marant and in particular to a dress that belonged to the Spring/Summer 2015 Etolie Line collection (Conlon, 2015). The accusation was made by the Mixe community, Indigenous people from Santa María Tlahuitoltepec, Oaxaca, in southwestern Mexico, and is motivated by the fact that the collection contains graphic elements that can be traced back to Mixe's traditional blouse, known as a huipil, whose origins date back 600 years (Larsson, 2015) (Fig. 65).

Moreover, while the original hupils of this population cost around 300 Mexican pesos in Tlahuitoltepec, the French designer's dress costs around 365 U.S. dollars, about 4500 pesos. Paradoxically, Marant was also sued by another French fashion label Antik Batik, who accused her of copying her design too. Marant under pressure from the Mixe community who sees the hupil as a symbol of their identity claimed that the design was not original but came from the village of Santa María Tlahuitoltepec and officially declared that she was not the author of the designs. In December 2015, the court ruled that neither Isabel Marant nor Antik Batik could hold copyright on huipil-like designs because huipils were a cultural product of the Mixe people (Shepher, 2015).

Cultural appropriation is a topic that has emerged especially in recent years. This can be partly explained by the fact that often cultural appropriation was concealed and justified as inspiration rather than outright plagiarism.

Fig. 65 – On the left women of Tlahuitoltepec and the right, the blouse from Marant's collection. Source: Conlon, 2015

Another famous example concerns American Urban Outfitters and its Navajo-themed clothing collection. The Navajo Nation is a Native American group living in the U.S. states of Arizona, Utah, and New Mexico, who immediately raised their voice to have the Navajo name removed from the company's products. Urban Outfitters tried to justify that "Navajo" was a generic term for a style or design, thereby making its use of the term legally permissible (Vezina, 2019). However, the Navajo consider their trademark to be one of their main assets, and according to the community, Urban Outfitters also violated the U.S. Indian Arts and Crafts Act of 1990, which states that it is unlawful to produce and sell products in a way that falsely suggests that they have been made by Native Americans (DOI, 1990). As the American multinational company continued to sell the indicted products through other company sub-brands, Urban Outfitters was sued in the U.S. District Court of New Mexico in 2012 (Riley et Al. 2016). In September 2016, the two parties reached an undisclosed settlement (Woolf, 2016), and in a press release, the president of Navajo Nation Russell Bagaye applauded Urban Outfitters for acknowledging the validity of the Navajo Nation trademarks and stated that anyone considering using commercially the Navajo name, designs or motifs, should ask the Navajo Nation for permission (Vezina, 2019) (Fig. 66).

According to Pamela Golbin, head of the department de la Mode et du Textile at the Musée des Arts Décoratifs in Paris, in an interview for WWD, she states that in the 19th century the term "exoticism" took hold in the applied and fine arts, and "in every creative field you saw the inspiration of faraway places" (Socha, 2020), and fashion is no exception. French designer Paul Poiret in 1910 was inspired by the traditions of the Middle East and Turkey when creating his harem pants and tunics; Yves Saint Laurent launched an African collection in 1967 (Vezina, 2019), and again Coco Chanel applied traditional Russian embroideries on tunics in her early collections in the 1920s (McAuley, 2017). The influence of the ethnic grew further from the late 1990s and early 2000s when brands such as Hermes featured stylized Indian saris and jodhpurs in its Spring/Summer 2008 collection (Scafidi, 2014), or Etrò, known for elevating an ethnic look into high haute couture, whit the Fall/Winter 2018 collection replete with Peruvian, Patagonian, Navajo and paisley designs, defined as *ethnic futurism* (Leitch, 2018).

Fig. 66 – Examples of Urban Outfitters products using the pattern of the Navajo community. Source: Indianz, 2016

Social media has brought this issue to light. “Far too often, this inspiration has led to the theft of culturally significant aesthetic characteristics from their communities of origin and a resultant exoticizing and stereotyping”

According to Lauren Indvik, fashion editor of the Financial Times, in an interview for BBC, a change of attitude has occurred with the era of social media, bringing easier and wider access to others. He said: "There wasn't the same visibility and awareness and dialogue around cultural appropriation years ago, but the internet has made it so much more visible". (Rackham, 2020). Of the same thought is Kirsten Scott, program leader in M.A. and B.A. fashion design at Istituto Marangoni in London, who says that social media has brought this issue to light, literally that “far too often, this inspiration has led to the theft of culturally significant aesthetic characteristics from their communities of origin and a resultant exoticizing, stereotyping and diminishing of richly diverse continents, countries, and societies” (Socha, 2020). We then have begun to talk about cultural appropriation, which begins when “a person or group of a certain culture (‘the appropriator’) ‘takes’ certain tangible or intangible objects (‘cultural products’) from a different culture (‘the source community’)” (Sharoni, 2017).

According to Professor Sally Engle Merry of NYU Law, the problem of cultural appropriation occurs when there is an improper recontextualization of a cultural product, which likens to “taking the tune and playing it in a different key or at a different tempo so that it becomes something different, yet still the same” (Sally, 1998). This means that they disregard the cultural significance for their holders and cause them profound cultural, social, and economic harm. The risk that this kind of attitude could lead to, is that “product might one day be completely disassociated from its source community, a result that is akin to the erasure of a community’s cultural identity” (Vezina, 2019). The existing laws to protect these communities can be not sufficient. For example, copyright is protection that to be enforced requires the work to be original, which is a criterion quite difficult to meet since traditional products have been passed down through several generations with no single, well-defined author, but belongs more to the community itself (Vezina, 2019). Therefore, without a defined author and an exact year of publication, it becomes impossible to determine how long a cultural product can be protected. Moreover, even if a cultural product was once given intellectual property protection, any term of protection would have already lapsed due to the passage of time (Sharoni, 2017). Trademarks seem to be the most effective countermeasure concerning these issues. For example, if we look at the example in the previous paragraph, the Navajo community leveraged the use of registered trademarks to support their case against Urban Outfitters. Another example is the Maasai, an Indigenous group living in Kenya and Tanzania. They own trademarks whose licensing revenue reached US $ 10 million a year by 2013, according to the Maasai IP Initiative (Light years IP, 2020). Nevertheless, trademarks do not provide perfect control against any forms of cultural appropriation. Indeed, the appropriation of Maasai traditional cultural expressions continues despite the enforcement of their trademark rights. Trademark protection indeed only extends to the use of the distinctive sign and does not necessarily shield the underlying cultural expressions as such from appropriation (Venzina, 2019). What is important to remember is that fashion can still be seen as an entryway to discover and learn more about another country and its culture. A virtuous example comes from Dior. In its cruise 2020 collection, paraded in Marrakech, creative director Maria Grazia Chiuri collaborated with African designers, in a shared tribute to craftsmanship. Chiuri, in an interview for the magazine WWD, explained her position better: "A lot of European designers like to borrow aspects of African cultures…. If they made some kind of an alliance with people and acquired embroidery or fabrics from actual African producers and promoted the collaboration, they would undercut the idea that they were just exploiting and appropriating” (Socha, 2020) (Fig. 67). Many brands, after some scandals hit them, have taken action so that these problems are not repeated. Gucci for example, after the accusations of racism for his balaclava jumper (Fig. 68), has appointed a diversity officer, while Prada has set up an advisory panel co-chaired by director Ava DuVernay after coming under similar fire in recent years (Rackham, 2020).

Fig. 67 – Cruise Collection Dior 2020. Source: Rogers, 2019

Fig. 68 – The Gucci jumper accused to resemble blackface. Source: Ong, 2019

4.7. ECONOMIC SUSTAINABILITY

As of today, being sustainable means incurring additional costs, which are inevitably transferred to the end consumer as prices increased. Bill Gates enters this environmental cost debate by introducing the concept of Green Premium, simply the difference in cost between doing something in a way that produces greenhouse gases and doing the same thing without emissions. To explain this concept, Bill Gates brings up the example of using an airplane with "traditional" jet fuel, which costs about $2.22 per gallon, versus using clean biofuels, which costs about $5.35 per gallon. The difference between these two - about 140% - is the Green Premium for jet fuel. In other words, if you want to get a jet with lower emissions, it is going to cost about 140% more, and of course, this impacts the cost for the end-users (Fortune, 2021). Similarly, this happens in the fashion world, where to buy sustainable products users must pay a higher price. This is what deters the 65% of consumers that desire sustainable products from actually buying them (Fashion United, 2021).

However, these costs should not be seen as a deterrent towards a sustainable wardrobe, but rather we should interrogate why sustainable products have these higher prices, especially if they are mistakenly compared to fast fashion products. Firstly, there is the choice of fabrics, meaning that ethical fashion should employ a discerning look at the process of procurement of materials. There are very strict governmental guidelines for materials to be certified organic, from pesticide use to labor rights, which all need to be considered. It may seem counterintuitive, but all the chemical pesticides and synthetic fertilizers help to keep the cost down for farmers of conventionally produced fabrics. With less toxic shortcuts comes more time and effort that goes into the planting, growing, harvesting, spinning, dyeing, and cutting of sustainable materials (Wolfe, 2019).

Natural fibers, like silk, cost more than polyester-blend materials, which are essentially plastic (Khatib, 2021), and the cost of this choice has a significant impact on the final selling price. As told by Emily Herron, founder and designer of EMLEE, who was looking for organic material and from a distributor who paid its cotton pickers fairly, “it was $ 30 per yard — two or three times the going rate for conventional fabrics. A dress can use up to six yards of fabric, so the material choice alone would add $ 75 to $ 120 to the cost of a sustainable dress”. On average, choosing sustainable materials carries from 20 to 30 % more costs (Ecocult, 2020). Apart from the higher unitary cost of production, an ethical approach to procurement implies paying prices to guarantee fair wages for workers.

The major hurdle for companies is then to combine environmental, social, and cultural sustainability, which all increase costs, with economic sustainability, which means guaranteeing affordable prices.

This means not only paying a minimum wage but a living wage so that the workers can afford a life of dignity and security. In addition, some other aspects when choosing a living wage, concern access to health care, transportation, housing, and safety nets, including severance and unemployment benefits (Khatib, 2021). All these negative effects on costs are amplified by the small production scale of sustainable materials, which still need to unlock relevant economies of scale (Khatib, 2021). Despite as of today resorting to sustainable materials is inconvenient from an economic point of view, it is reasonable to expect in the years to come decreasing costs as adoption and demand increase. The major hurdle for companies is then to combine environmental, social, and cultural sustainability, which all increase costs, with economic sustainability, which means offering affordable prices to the market.

Fig. 69 – Example of information that Green Story shows you. Source: Green Story, 2021

On the other hand, taking the end-user point of view, we should go beyond the actual logic of considering the price as a proxy of clothes value. As we have seen previously, it was fast fashion that forged the product logic of low-cost and fast rotation, whereas sustainable products oppose this logic and should be created to last long, even if it implies higher costs. For this reason, a useful metric that may help users change their mindset is the *cost per wear*, which considers not only the upfront price but also the number of uses (or wears). The idea is that rather than purchasing five $10 t-shirts that will stretch beyond use after a few wears, it would be reasonable to buy only one $40 t-shirt, designed to last years. While the cost per wear of the former t-shirts would end up being a staggering $2, it could reach even a few cents for sustainable and durable products (Wolfe, 2019). There are lots of start-ups that are helping brands show their consumers why the price of eco-fashion is not premium. Through accurate, interactive data, greenstory.ca shows the environmental savings that come from a sustainable supply chain in a way that consumers can understand and appreciate another meaning of value.

Imagine if users knew that a t-shirt has saved 3 days of drinking water, 10 flights around the world, and 15 plastic bottles, for example. These relatable metrics would surely help convince people that a product makes a positive impact that is worth the price (Fashion United, 2021) (Fig. 69).

Apart from reshaping the perception that users have about clothes value, which means detaching from upfront price and introducing other metrics, there is another alternative to improve the economic sustainability of fashion. Indeed, the concept of price is so important in a linear business model, based on one single transaction; in this case, clearly, a more durable and higher-quality product ends up costing a higher price. If the business models are revolutionized much more people would have access to fashion products with lower financial efforts: for example, through resale, a garment can be sold at a lower price, since there is not a single transaction but multiple sales along the lifecycle. Rental is also an alternative since the garment can be paid just a fraction of the upfront price for temporary access.

We should go beyond the actual logic of considering the price as a proxy of clothes value. A useful metric that may help users change their mindset is the cost per wear, which considers not only the upfront price but also the number of uses.

“Cheap prices make us believe they bring about savings for consumers. This may appear true in the short term, with a narrow focus and looking just at the money in our wallets, but all of us, as global citizens, will ultimately end up paying the external cost, the true cost for the unsustainable consumption and production of cheap clothing.” (Fressynet, 2021).

4.8. SUSTAINABILITY ASSESSMENT: AS-IS ANALYSIS

Over the last few years, we have seen a boom in sustainable investing with a consequent increase in environmental, social, and governance (ESG) funds. According to Morningstar (2021), sustainable investments have reached a record high of nearly $ 1.7 trillion by the end of 2020 (Fig. 70). Fashion companies have taken advantage of this situation and are issuing debt linked to sustainability targets (Nanda, 2021). The term "sustainability" in the reports from companies is more than duplicated, going alongside terms that have always been characteristic of doing business such as profit and growth (Business of Fashion, 2021) (Fig. 71). Obviously, within the fashion industry, not all companies are equally oriented towards sustainability; on the contrary, there are many examples of greenwashing, which means misleading advertisements or false claims made by companies that suggest they are caring for the environment more than they really are (Mehar, 2021). For this reason, several independent organizations are developing tools to provide a clear and transparent benchmark, which can be used both to evaluate and compare individual companies and to help them achieve more sustainable goals.

In particular, for this analysis, we are going to consider two tools, one developed by Business of Fashion, the *Sustainability Index SI*, and the other developed by The Boston Consulting Group (BCG) together with Global Fashion Agenda (GFA), the *Pulse Score PS*. The latter is based on the index developed by the Sustainable apparel coalition, Higg Index & Retail Module (BRM) as the underlying data source, and analyzes companies based on size and price positioning, and reweights according to revenue contribution (Global Fashion Agenda et Al. 2019). The Sustainability Index instead, considers the 15 largest companies in the industry by revenue and 338 different metrics to assess companies' progress towards 16 time-bound targets, which fall within six categories: transparency, emissions, water and chemicals, materials, workers' rights, and waste (Business of Fashion, 2021). Analyzing these two indicators is useful because the first gives us a clear picture of how the fashion industry is positioned today about the issues analyzed in the previous paragraphs, while the second gives us an idea of the direction in which the leaders of the sector are moving. The output of both is a score from 0 to 100 that gives an overall evaluation of the industry and allows over-time progress assessment. According to both tools, the results turn out to be quite low: 36 out of 100 for the *SI* and 42 for the *PS*, which is rising from 32 in 2017 (Global Fashion Agenda et Al. 2019). Both indicators clearly emphasize that there is still a long way to go to improve the fashion industry.

Fig. 70 – Increase in sustainable funds investing. Source: Morningstar, 2021, adapted by BoF, 2021

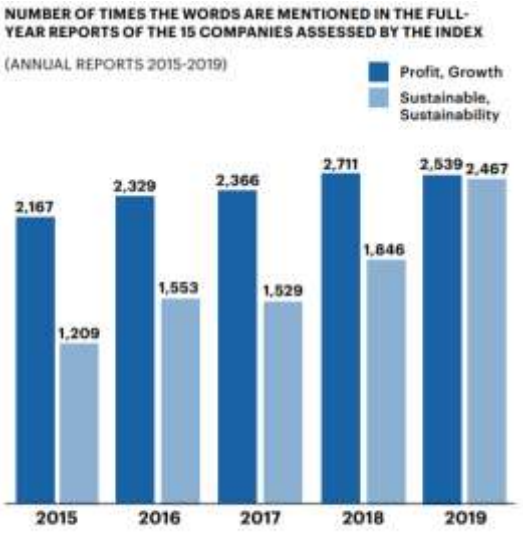


Fig. 71 – Increase in the use of the "sustainable" in reports. Source: BoF, 2021

Fig. 72 – Pulse Score 2019. Companies are divided by segment and size. Source: Global Fashion Agenda et Al. 2019

More than the price range, it is the size of companies that matter most, with large companies being the most sustainable. Giant sports players are those with the highest score, thanks to an in-depth collaboration with various tiers of their supply chain.

Looking at the segmentation of companies (Fig. 72), we note that currently, more than the price range, it is the size of companies that matter most, with large companies being the most sustainable. Giant sports players are those with the highest score, thanks to a long tradition of focusing on materials and in-depth collaboration with various tiers of their supply chain. Generally, the fashion giants are scoring better results, since they manage to carry out numerous initiatives along the supply chain, thanks to their considerable financial resources. However, it should be noted that small and medium-sized companies, which have a relevant share, are those that have made the greatest improvements over the previous year. Apart from size, the largest improvements are recorded in the lower price segment, even the biggest companies in this segment are managing to do only small incremental improvement to their Pulse Scores (Global Fashion Agenda et Al. 2019). If we consider the headquarter base, European brands tend to score higher on environmental dimensions, while their U.S. counterparts are more likely to follow social best practices. By type of ownership, family-owned firms perform betters, while most (but not all) public companies tend to focus on maximizing short-term shareholder value (Boston Consulting Group, 2017). Pulse Score also specifically examines each phase of the value chain (Fig. 73) and in particular two steps show above-average performance: Management & Target Setting and Supply Chain. The former covers enabling activities and overarching aspects of sustainability that involve target definition, strategy setting, and governance. The latter step essentially encompasses the production of garments and footwear. As for other steps in the value chain, Product Development showed average results, whereas Packaging, Transportation, Distribution, Retail, and Use & End-of-Use showed unsatisfying performance. Product development and design have had a big improvement over the years, and this will be crucial, given the importance that design has in driving the whole value chain towards a more sustainable footprint, as we discussed in the breakdown of environmental impacts for the value chain steps. Companies have progressed by making design and product development teams more aware of the environmental and social impact of their decisions (Boston Consulting Group, 2017).

EXHIBIT 5 Pulse Scores by value chain step: Management & Target Setting and Supply Chain show strongest scores

Weak — Strong

<20 | 20-29 | 30-39 | 40-49 | 50-59 | 60-69 | >70

	Management & Target Setting	Product Development	Supply Chain	Packaging	Transportation	Distribution Centres	Retail Stores	Product Use & End-of-Use
Normalised total	56	38	42	32	30	31	28	31
1st quartile	75	53	68	54	46	48	45	47
2nd quartile	68	45	46	23	22	22	28	35
3rd quartile	59	41	42	30	32	33	24	34
4th quartile	21	11	14	19	19	19	17	9
Spread Top/Bottom	54	42	54	35	27	29	28	38

Fig. 73 – The BoF Sustainability Index with a focus on the different steps of the value chain. Source: Business of Fashion, 2021

As we mentioned, BoF's Sustainability Index allows us to understand how industry leaders are performing across six distinct categories (Fig. 74). What is immediately noticeable, is the great disparity within the industry between 15 companies and six categories we examined. Kering and Nike outperformed their peers, while Under Armour and Richemont were the weakest overall. Companies have performed best first in terms of transparency and then also in terms of emissions. Transparency is meant as product traceability and the disclosure of environmental and social impact analysis. Thanks also to Fashion Revolution's Transparency Index, this topic has gained public attention and helped drive substantial progress, but still, the industry is performing quite poor results, with the overall transparency index at 23% in 2020 (Fig. 75). The good performance in terms of emissions can be explained by the adoption of standards for corporate greenhouse gas emissions reporting and target-setting aligned with global goals to limit climate change. Worse results have been obtained in worker rights because not all companies get deeply informed beyond the second tier of their supply chain, but most continue to rely on partners' voluntary initiatives and private auditing firms. If we look at the worst-performing area, we find waste generation.

All companies claim to be active in reducing waste, but little information exists on their achievements, and this is confirmed by the Fashion Industry (2020) report, which states that only 27% of companies publish information about the steps they're taking to reduce the amount of clothing and textile waste. Furthermore, massive investments and new actions on their business model are still needed to improve this indicator (Business of Fashion, 2021).

Fig. 75 – Fashion Revolution's Transparency Index, valuation of transparency. Source: Fashion Revolution Transparency Index 2020

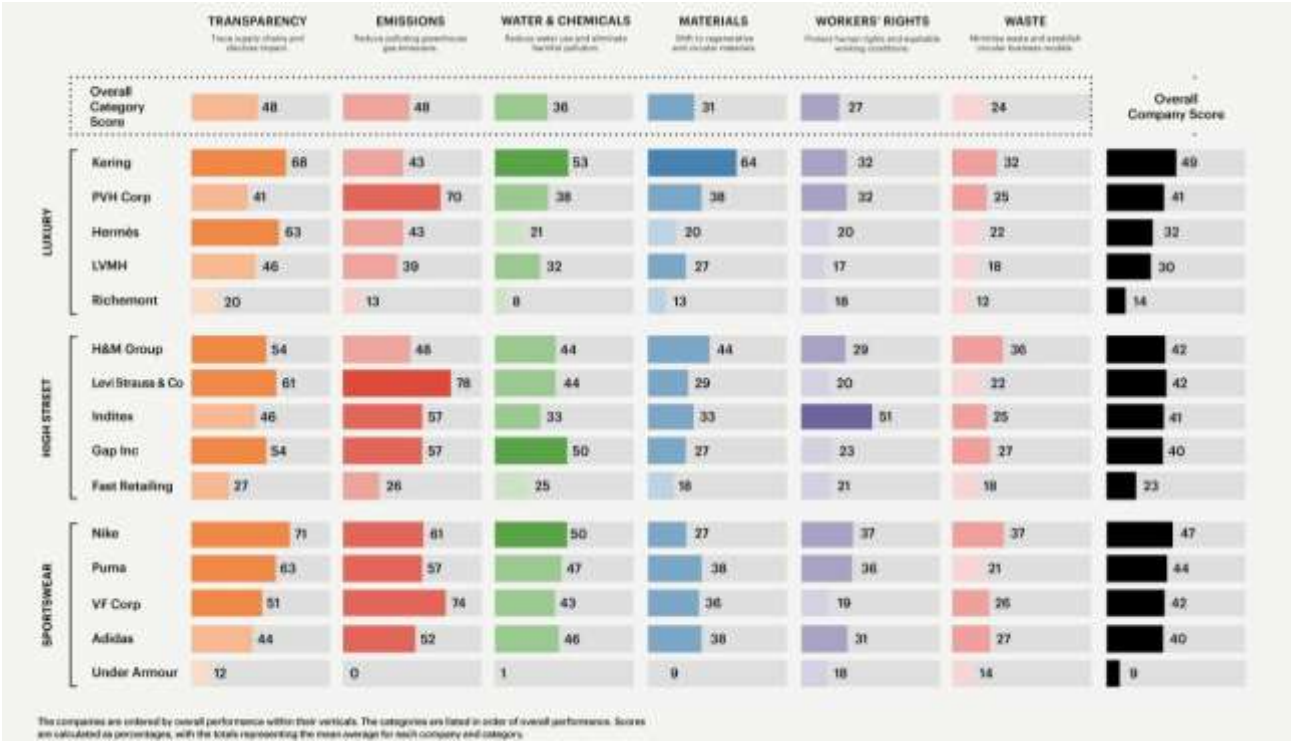


Fig. 74 – The BoF Sustainability Index with a focus on the 15 biggest companies. Source: Business of Fashion, 2021

4.9. INTERNATIONAL POLICIES AND COMMITMENTS

Today's world is being shaken by social, environmental, and economic changes on a global scale. These changes are happening more and more suddenly and need action to counteract immediately. The fashion industry is the second most polluting industry and is shaken by vast social problems. Pressure from various stakeholders and NGOs has already led policymakers and companies to act. International institutes have realized that to achieve concrete results, it is no longer enough to let the various states act independently, but joint efforts are needed to have a consistent impact. Based on this idea, various international policies and agreements have been developed in recent years.

Europe 2020 Strategy – 2010

Launched by the European Commission for the decade 2010 - 2020, and seen as a continuation of the previous agreement *Lisbon 2000*, this project aimed at promoting three priorities to all states of the European Union (Fig. 76):

1- **Smart growth:** developing an economy based on knowledge and innovation,
2- **Sustainable growth:** promoting a more resource-efficient, greener, and more competitive economy,
3- **Inclusive growth:** fostering a high-employment economy, delivering social and territorial cohesion (European Commission, 2010).

The strategy identified eight goals accompanied by indicators to be achieved by the end of 2020, covering employment, research and development, climate and energy, education, social inclusion, and poverty reduction. The combination of these goals led to a total of seven flagship initiatives that are to promote smart, sustainable, and inclusive growth and guide EU and member state policy. (European Commission, 2010). It should be emphasized that although this project was later surpassed by two other treaties, the Green Deal and the Sustainable Development Goals, they all share many aspects, symbolizing its relevance and importance for EU zone development.

Paris Climate Agreement – 2015

The Paris Agreement is focused on combating climate change and can be seen as the culmination of international efforts to combat this issue. The first international treaties were the United Nations Framework Convention on Climate Change of 1992, where, at the Rio Earth Summit in Brazil, 107 countries adopted a framework to set binding emissions, without however setting limits to greenhouse gas emissions. The Kyoto Protocol, 1997 at COP 3 in Japan, established binding emissions reduction targets for developed countries, however, countries such as the United States, China, and India were absent, thus limiting the impact of this treaty (UNFCCC, 2008). Instead, with the Paris commitments for the first time, a binding agreement is made that requires nations to take ambitious efforts to combat severely climate change. The pact was signed by 196 Parties at the 21st Conference of the Parties 21 in Paris, the 12th December 2015, and entered into force on the 4th November 2016 (UNFCCC, 2015). Its goal is to limit global warming to less than 2, preferably 1.5 Celsius degrees, compared to pre-industrial levels in 1750 (United Nations, 2015). With the Paris Agreement, countries established an enhanced transparency framework (ETF); under the ETF, beginning in 2024, countries will transparently report on actions taken and progress in climate change mitigation, adaptation measures, and support provided or received. It also provides international procedures for reviewing submitted reports (UNFCCC,2015).

Fig. 76 –Pillars of the Europe 2020 strategy. Source: European Commission, 2010

2030 Agenda for Sustainable Development – 2015

The Member States of the United Nations adopted the Sustainable Development Goals (SDGs) by General Assembly resolution A/RES/70/1 of 25th September 2015. The purpose of this resolution is to achieve these 17 goals by 2030 ending all forms of poverty, combating inequalities, and addressing climate change, ensuring that no one is left behind (UN, 2019) (Fig. 77). To achieve sustainable development, it is fundamental to harmonize three key elements: economic growth, social inclusion, and environmental protection (UN a, 2015). A characteristic for which this agreement is innovative is its universality, meaning that everyone is required to act, all states and all sectors, all institutions, public and private. Integration also, since the goals are all connected, so to achieve an effective sustainable development, actors are forced to act on all the others. Transformation, since everyone needs to radically change the way of living on the Earth, a change from within. Each goal typically has 8 – 12 targets, and each target has between 1 and 4 indicators used to measure progress. The targets are either "outcome" targets (circumstances to be attained) or "means of implementation" targets (Bartram, 2018). The global indicator framework for Sustainable Development Goals was developed by the Inter-Agency and Expert Group on SDG Indicators (IAEG - SDGs) and will be refined annually and comprehensively reviewed by the Statistical Commission at its fifty-first session in March 2020 and its fifty-sixth session, to be held in 2025 (UNSTATS, 2021).

Fig. 77 – 17 Sustainable Development Goals (SDGs) developed by United Nations. Source: Wikipedia, 2021

Modern Slavery Act – 2019

It is a 2019 commonwealth act, which incorporates the *2011 United Nations Guiding Principles on Business and Human Rights*. The Modern Slavery Act was introduced to combat the practice of what is known as modern slavery or the condition whereby offenders use coercion, threats, or deception to exploit victims, undermining their freedom and the term is used to describe practices such as substandard working conditions or underpayment of workers. This includes a requirement that large corporations respect human rights in their operations and supply chains. They also have a reporting requirement, and this should help to identify and address their modern slavery risks and maintain responsible and transparent supply chains (Gov AU, 2021).

Fashion Pact -2019

This alliance was born in 2019 at the behest of French President Macron during the G7 meeting in Biarritz, France, who tasked François-Henri Pinault, owner of the Kering Group, with bringing together the industry's big players to strengthen their shared commitment to protecting the planet. The pact signed in 2019 brings together a coalition of global companies, including suppliers and distributors, to achieve a series of goals that can be summarized in 3 macro-areas: halting global warming, restoring biodiversity, and protecting the oceans (The fashion pact, 2020). To better monitor the 3 action areas, the companies have partnered with the Boston Consulting Group to develop a digital dashboard of KPIs. One year after the treaty was signed, significant milestones have already been achieved. On the first point of global warming, the companies jointly reduced GHG emissions by about 350 - 450,000 tons of CO2 equivalent, and a significant shift toward sourcing environmentally friendly raw materials, such as a reduction of about 40% on cotton. As for the second area, the results have been interesting, taking into account that before the pact 80% of companies had never committed to biodiversity, and the goal to be achieved is the support of zero deforestation and sustainable forest management by 2025. Regarding oceans protection, on the other hand, the first commitment is the elimination of unnecessary plastic and packaging by 2030 (Bolelli, 2020). The pact, initially signed by 32 companies, has now more than doubled the number of its signatories to 71.

Green Deal – 2020

The Green Deal is an extremely ambitious project, strongly advocated by the European Commission led by Ursula von der Leyen. It aims at transforming the European Union into a prosperous, resource-efficient society with no net emissions of greenhouse gases in 2050 and where economic growth is decoupled from resource use (European Commission, 2019). For the achievement of the long-term strategy, that is the achievement of climate neutrality by 2050, the Commission has also set intermediate targets, such as the objective of reducing EU greenhouse gas emissions by 2030 by at least 50%; these objectives are supported by the Commission through additional climate-related policy instruments. Another objective is to improve energy efficiency, by decarbonizing the energy system and investing in a smarter industrial system, trying to seize most of the advantages from circular economy, smart and sustainable mobility. To understand the relevance of this ambitious project, in the first 10 years, it will be financed with about 1000 billion euros (European Commision, 2019).

4.10. CORPORATE SOCIAL RESPONSIBILITY

As was introduced earlier, the international efforts of various nations must be accompanied by a real commitment from the individual companies. Companies have realized that it is no longer sufficient to simply mitigate their impacts, but they must start to act proactively and also stimulate a change in consumers' mindset. In this direction, Corporate Social Responsibility, which refers to the voluntary integration of social and environmental issues in business operations and relations (European Commission, 2001), has become increasingly important: Fig. 78 shows the increase in the use of this term within the reporting of the various companies. CSR in recent years has also undergone an evolution, so to understand the actual meaning it is appropriate to start from its origins, observe its evolution, and the main models related to the fashion industry.

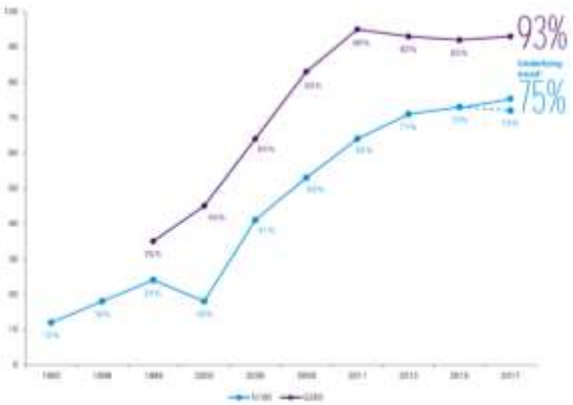


Fig. 78 – Growth in global CR reporting rates since 1993. Source: KPMG Survey of Corporate Responsibility Reporting 2017

Fig. 79 – The Four levels of CSR according to Carroll. Source: Thaker, 2019

The concept of CSR as the study of the social impact of companies can be traced back to Bowen with his treatise "Social Responsibilities of the Businessman"; he was the first author to propose a new approach to management which aimed at improving the business response to its social impact (Carroll 1999). However, in the first years of evolution, authors approached the concept of CSR with a vision of doing business linked to the "neoclassical theory of the firm", according to which companies exist and make decisions to maximize their profits. Thus Friedman (1970) sees social activities as a cost and, since they cannot in any way repay any investment, only limited resources should be devoted to them. Consequently, if an intervention is to be made, it must be carried out by the responsibility of the individual shareholder or employee and not by the company responsibility. Davis (1973) also found himself in line with this view, arguing that companies had not developed enough skills to do business and focusing on these issues that could deviate them from their mission, thus both reducing productivity and risking very little positive social impact. Especially in the international arena, foreign companies that do not adopt CSR policies and related costs would have an advantage. It is important to recall these early theories because as can be seen around us every day, many companies still limit their goal at profits; some opportunistically adopt responsibility policies only as a matter of image and reputation.

One of the most significant contributions to the topic was proposed by Carroll (Fig. 79), who identifies four levels of Corporate Social Responsibility: economic, legal, ethical, and philanthropic responsibility (Carroll B., 1991). *Economic responsibility* refers to the ability of companies to profitably produce and sell products and services needed by society: for example, it is important for a company to maintain a high level of efficiency, to be able to maintain a competitive advantage, and to strive for profit maximization. *Legal responsibility* refers to the obligations in terms of laws and regulations that companies have to comply with: it is, therefore, essential that a company operates in such a way as to comply with local or state laws, and that it produces products and services in compliance with at least the minimum legal requirements. *Ethical and philanthropic responsibilities* refer to the social actions that companies can take to improve the social environment in which they operate and meet the expectations of a wider range of

stakeholders. However, as Carroll points out, it is crucial to implement a distinction between ethical and philanthropic responsibility. In fact, the former refers to a set of standards, norms, and expectations that society expects a company to pursue, while philanthropic responsibility is more discretionary and voluntary: communities want companies to contribute their money, facilities, and time to humanitarian programs or purposes, but do not consider companies unethical if they do not provide the desired level. Carroll's contribution is extremely important because, by placing this hierarchical classification, the author introduces for the first time the concept of *voluntariness* on the part of the company, which by going beyond the economic and legal dimension alone, can improve the social context in which it operates.

In recent years, we have witnessed an increase in public attention to social and environmental issues and a conviction that companies, often considered guilty of many problems, must act directly to address these issues. This has led to further evolution of the concept of traditional CSR into what is known today as strategic CSR, so the ability of a company to integrate social and environmental concerns into traditional profit-maximizing business activities, thereby realizing a differential advantage for the company. One of the most popular models that best reveals how it is possible to positively exploit the interdependencies between company and society is the one proposed by Porter and Kramer and based on the concept of "inside-out" and "inside-in" linkages (Porter et Al. 2006). According to this framework, the term "inside-out" linkages indicates negative or positive externalities, which fall on the community and are generated by activities carried out internally to the company. The classic example is that of pollution: if the company invests in a production plant capable of using energy more efficiently, CO2 emissions will decrease. To make these positive connections between society and the company, the company must map the impact that each of the activities in the value chain has on the external society. The environment in which the company operates can significantly influence its long-term profitability and performance. In this sense, factors such as the availability of local suppliers, access to resources, and efficient infrastructure should be considered. For example, having an effective and robust education system is a key ingredient in enabling a company to hire skilled workers in the future and consequently maximize productivity in the long run. The Diamond Framework helps us understand these relationships, showing how the conditions in which a firm operates affect its competitiveness. If companies manage their CSR activities through their value chain and act on the context in which they operate, they will have a "distinctive value proposition and a sustainable competitive advantage" (Porter et Al. 2006).

As strategic CSR, so the ability of a company to integrate social and environmental concerns into traditional profit-maximizing business activities, thereby realizing a differential advantage for the company.

In the following years, other models seen as an evolution of the strategic CSR have been developed, leading to greater involvement of companies in social activities. A further step forward from the strategic CSR model has been made by Porter and Kramer in 2011 in an article published in the Harvard Business Review. The article opens with "capitalisms is under siege", in which the authors take up the fact that the classic and limited paradigm of doing business is to be considered as the main cause of social, environmental, and economic problems and it is, therefore, necessary a new business model that can reinvent it. They take up and further develop the concept of shared value, which they had already mentioned in 2006, stating that "Shared value creation focuses on identifying and expanding the connections between societal and economic progress" (Porter et Al. 2011). The authors recognize three levers of shared value creation: *reconceiving* products and markets, *redefining* the concept of productivity in the value chain, and *ensuring* the development of local clusters. Reconceiving products and markets means developing new products and services for existing or new markets that better meet society's needs. Companies need to rethink products and services to be provided to those consumers who have hitherto been neglected by traditional markets. Taken together, these are identified as the so-called "base of the pyramid", for example, all those people living on less than $ 8 per day (Prahalad et Al. 2002).

Since the population living in these conditions consists of about 4 billion people, a large portion of needs remain unmet and, if well addressed, can improve the profitability of the enterprise. The second lever for creating shared value is to redefine productivity within the company's value chain, meaning how resources are leveraged, the conditions under which employees work, how energy is used. There are several areas of the value chain where such opportunities can be identified: from procurement to logistics or through creating more favorable conditions to increase worker productivity, for example by promoting employee empowerment or improving working conditions. Finally, the third strategy for contributing to the realization of shared value is to encourage the development of local clusters, which are defined by the authors as "the geographic concentration of companies, associated businesses, suppliers, service providers, and logistics infrastructure providers in a given field" (Porter et Al. 2011). Elements such as the presence of viable curricula, a quality, public health service, and the presence of infrastructures such as electricity, roads, or railroads ensure that the company can rely on an experienced and healthy workforce and an efficient logistics system. Carroll (2015) foresees as CSR future scenario an increase in different forces: stakeholder engagement, prevalence, and power of ethically sensitive consumers, the level of sophistication of non-governmental organizations (NGOs), employees as a CSR-driving force, along with CSR activity up, down and across the global supply chain.

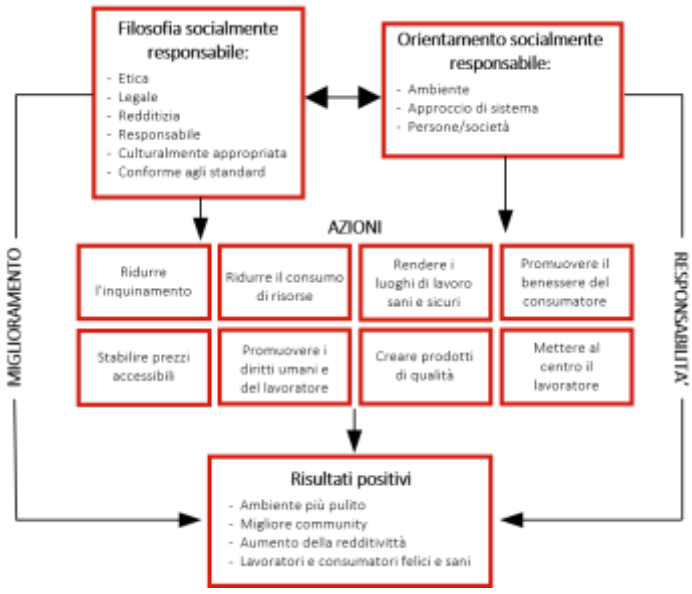


Fig. 80 – An expanded model of Dickson, Loker, Eckman. Source: Dickson et Al. 2009

Though, he warns that there are competing frameworks and new concepts that might slow the global expansion and implementation of CSR, and even shift the public interest towards new areas. For example, Corporate Sustainability, Corporate

Companies must build a robust philosophy, joining ethics and responsibility with profitability and legality, and need also to approach business with a systemic orientation considering stakeholders and environment.

Social Performance, Creation of Shared Value, Corporate Citizenship, Environmental Corporate Social Responsibility, Environmental Social and Governance Criteria. The future of CSR will also have to take into consideration the latest technological advances and their role as part of new business frameworks and strategies. The adoption and adaptation to new digitalization processes and tools, as well as the incorporation of Artificial Intelligence into the business environment, are relevant challenges not only for the CSR debate but for corporations in general. In this sense, business frameworks will have to adapt and evolve to embrace the latest tools, but they will need to do so through an overarching and holistic framework that is based on the principles of social responsibility in a way that combines: the notions of sustainability, the generation of shared value, and the belief that companies can redefine their purpose to do what is best for the world (Agudelo et Al. 2019).

Having introduced the main models on CSR and understood what shared value means today, it is easier to understand the main models that have been introduced in the fashion industry. One of the most important models was introduced in 2009 by Dickson, Locker, and Eckman (Fig. 80). To develop this model, they referred to the triple bottom line introduced by Carroll, considering then financial, social, and environmental aspects.

This model is articulated in three parts: based on a socially responsible *philosophy* and *orientation*, companies can take concrete *actions* and obtain *positive results*. In other words, companies must build a robust philosophy, joining ethics and responsibility with profitability and legality, and need also to approach business with a systemic orientation considering stakeholders and environment. Concrete actions are to be taken such as reducing consumption of resources, promoting consumers' and workers' welfare, and making high-quality products. With this approach, the whole ecosystem will benefit from positive results, such as a cleaner environment, a better community to live in with safer and happier workers and consumers. Of particular importance is the work-centric orientation of this model, which means that it is not only necessary to take into account the norms of the countries in which a company operates, but it is also necessary to go further and consider the expectations of workers. Moreover, a dynamic perspective must be maintained, meaning that the social responsibility of fashion companies is not static, but is given by the continuity of efforts both in actions and in obtaining results (Rinaldi, Testa 2012; Dickson, Locker, Eckman, 2009). This model is later taken up by Rinaldi and Testa, who integrate the work-centric view of the previous model with a consumer-centric perspective, to meet all consumer needs (Fig. 81).

Fig. 81 – Work-centric and customer-centric model. Source: Rinaldi et Al. 2012

This model is based on three variables: ethics, aesthetics, and profitability, which connect the fashion firm with different contexts. Apart from the environmental and social contexts, which are common to all industries, the media context is particularly important for fashion, since it implies how to communicate identity to the final customer, which necessarily should be built upon the three central variables. Artistic, cultural, and territorial context is also extremely relevant since fashion companies need to recover the genius loci and a concrete relationship with the territory.

Apart from the Environmental and Social as well as Normative and Institutional contexts, for fashion are of particular importance Media and Artistic, Cultural and Territorial contexts.

Finally, in the normative and institutional context, fashion responsible firms can not only comply with regulations on environmental and social protection but also voluntarily adopt a proactive attitude in respect of more advanced standards, such as ethical and environmental certification (Rinaldi, Testa 2012). Not least in 2007, the Italian Chamber of Fashion also released its sustainability guidelines in the Sustainability Manifesto for Italian Fashion with a decalogue that defines concrete actions for Italian companies. It is structured on the phases of the value chain with the design phase holding a special role, for its importance of determining the following impacts. Some guidelines are manufacturing products that can last for a long time, choosing raw materials with high environmental and social value, reducing both social and environmental impacts of production processes, and so on with distribution, marketing, and sales, including basically sustainability criteria along the entire path of a product. Additionally, other results can be obtained through management systems that aim at efficiency, country systems that support the territory and protect the made in Italy, business ethics that integrate universal values in the brand, transparency in communication with stakeholders, education, and promotion of ethics and sustainability (Camera Nazionale Della Moda Italiana, 2012).

4.11. COMMUNICATING COMMITMENTS TO END-USERS

If it is fundamental for companies to switch paradigms and adopt a CSR strategy, it is equally important that final users perceive firms' commitments. There are several information tools that companies can make available to stakeholders to increase the transparency of their business. Firms can publish reports apart from the traditional financial statements, addressing specific topics of interest. These documents are not compulsory yet, for example in Italy the obligation applies only to voluntary service centers, social enterprises such as cooperatives or consortia, and third sector entities (tornaconto&c., 2016). Alongside reporting, a business can resort to third-party certifications, proving their CSR efforts in the eyes of users.

Among the reporting documents, the first type is defined as the *social report*. As explained in the preceding paragraphs, companies, both public and private, find themselves accountable for their performance not only in economic terms but also in social terms. This type of reporting is a direct consequence of the Corporate Social Responsibility process and is a reporting system that makes it possible to disclose the impact on all categories of stakeholders involved. As this document is mostly voluntary, companies can turn to third-party entities to certify its veracity. The most common standards for this type of documentation are as follows (Rinaldi Testa, 2012): Worldwide Responsible Apparel Production (WRAP), world's most accepted independent certification for the apparel/textile, Social Accountability 8000 (SA8000), that focus on the fair and decent treatment of workers and to demonstrate their adherence to the highest social standards (SAI, 2021), Global Organic Textile Standard (GOTS), the worldwide leading standard for organic textile production that certifies manufacturers of yarns, fabrics, clothes, home textiles, mattresses, and more (GOTS, 2021).

The *environmental report* is similar to the previous one, but the objective is to evaluate the company's environmental performance and impact on the ecosystem. Since this is also voluntary, several organizations propose guidelines for proper reporting, including those of the Council of European Chemical Industry (CEFIC) and those of PERI (Public Environmental Reporting Initiative) with indicators that measure environmental management, environmental impact, environmental performance, environmental efficiency, and potential effect (Rinaldi, Testa 2012).

The most common international standards for environmental sustainability are classified under the acronym ISO14000, which identifies a series of standards established by the international organization for standardization ISO. The most widely used is ISO 14001, which sets out the requirements for an environmental management system. The guidelines provided by the global reporting initiative represent the best known and most widely used standard for environmental and social sustainability (Rinaldi, Testa 2012).

A final document that has become increasingly popular in recent years is the *code of ethics*. The need for this kind of documentation has arisen from the fact that national contracts regulate many aspects of company life, but neglect some, including moral and ethical behavior. This is a document containing a set of social and moral rules drawn up by the company and the sanctions provided for violations of the code (Randstad, 2018).

If it is fundamental for companies to switch paradigms and adopt a CSR strategy, it is equally important that final users perceive firms' commitments. Firms can publish reports apart from the traditional financial statements, addressing specific topics of interest.

On the wave of all these changes, we saw the birth in 2006 of the B-Corp movement. This movement was started by a group of entrepreneurs in the U.S. when they decided it was necessary to try to change the dominant model and to promote a radical evolution of capitalism (Rinaldi 2019): thus, the B-Corps were born. They stand out in the marketplace from all other businesses because, in addition to pursuing profit, they continuously innovate to maximize their positive impact on employees, the communities in which they operate, the environment, and all stakeholders (Unibo, 2021). To achieve and maintain certification, companies must measure their performance and externalities through the B Impact Assessment (BIA) measurement standard and achieve a score of at least 80 points (out of 200); firms get certified after being analyzed by the nonprofit B Lab. This certification is recognized in Italy, U.S., Colombia, Ecuador, and France (Bcorporation, 2021). The BIA, which is free and available online, looks at impacts in 5 areas: Governance, Workers, Community, Environment, and Customers (Bcorporation a, 2021). In addition, through the publication of a benefits report or Annual Impact Report, stakeholders receive information to determine whether they agree with the benefit corporation's ways of achieving a positive impact on society and the environment. Currently, in the world, more than 4000 companies are recognized with the B-Corp certificate in 153 countries (Bcorporation a, 2021) Among the first and most virtuous companies to take this certification in the fashion industry was Patagonia, which joined this community in 2012. Several are the initiatives that have made this company one of the most virtuous in the fashion industry: its extensive use of sustainable materials, 49% of fabrics by weight is made from recycling (29%) or renewable (20%), the design and choices of high quality and easy to repair, the employment of women, with 50% of the workforce, and a lot of other initiatives, such as on the Black Friday of 2016, Patagonia pledged 100% of sales to environmental organizations, for a total of $ 10 million.

4.12. ALTERNATIVE BUSINESS MODELS

Having become the unsustainability of the current structure of the fashion world so evident to the public, in recent years we have witnessed the spread of alternative business models often based on circularity, which breaks the traditional linear path. How value is created in circular systems is radically different from the way it is created in linear systems. In essence, a single garment can create value repeatedly, through sale and resale, repeated rental, or being sold, repaired, returned, or recycled, and resold again to start the loop over (McKinsey et Al. 2021). Companies no longer focus mainly on driving more volume and squeezing out cost through greater efficiency in supply chains, factories, and operations. Rather, they concentrate on rethinking products and services from the bottom up to prepare for inevitable resource constraints (Accenture, 2014). There has never been a better time for fashion retailers to commit to the circular economy: technological advances, infrastructure improvements, the emergence of start-ups, shifting consumer preferences, new circular design practices, alongside increasing regulatory pressure, are creating a favorable environment for established retailers to pursue circular economy initiatives with certainty (Fashion for Good, 2019). Circular patterns can become the biggest disruption of the fashion industry over the next decade (McKinsey et Al. 2021).

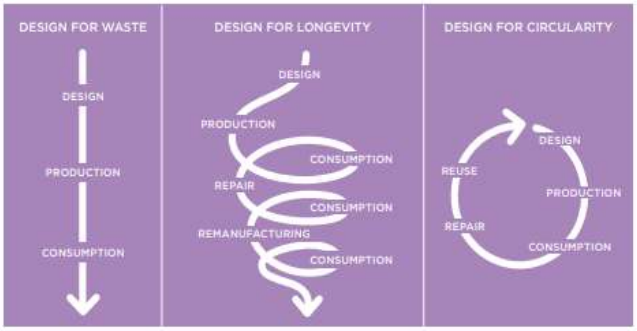


Fig. 82 Different types of design to increase durability and cyclability. Source: Fashion for Good, 2020

The most popular business models include *subscription-based rental*, where the user pays a monthly fee to access a range of garments; *rental*, a one-time rental of a garment for a short period; and *resale*, which is the recovery and resale of a garment (Fashion for Good et Al. 2019). Before entering the details of each model, it must be emphasized that for all these models to reach their full potential, it is necessary to improve garment quality and durability. A fundamental aspect is therefore to intervene in the design phase of the product. As we introduced earlier in this chapter, it is the phase responsible for cost-impacting decisions, the materials to be used, which manufacturing processes are the best, or how to manage the end-of-life, whether the product will be discarded or recycled. Lately, some different design paradigms have emerged to fight the traditional linear model, or as it is called "design x waste" (Fig. 82). The new models can be distinguished by their purpose, whether it is to increase *longevity* or to encourage *circularity*. Strategies to increase durability are achieved through higher quality of materials, and by creating timeless designs; still, this may not be enough because some parts or components of clothes, such as buttons or zippers, will need to be repaired; in this case, companies must also provide whatever is needed to ensure repairability. The second paradigm instead, design x circularity, relates to choosing materials that can be recycled, or are biodegradable, and ensuring an easy disassembly process so that the various components can be separated and reused or recycled separately (Global Fashion Agenda, 2020).

How value is created in circular systems is radically different from the way it is created in linear systems. In essence, a single garment can create value repeatedly, through sale and resale, repeated rental, or being sold, repaired, returned, or recycled, and resold again to start the loop over.

Going more into detail of circular models, the subscription rental consists of allowing customers to pay a flat monthly service fee to have a fixed number of garments on loan at any one time (Fig. 83). Subscription models in fashion have grown more than 100% in 5 years, driven by demand from high earning, young, urbanite consumers (Columbus, 2018) with companies capitalizing on low barriers to entry. Fashion currently represents 6% of the global subscription market and is rapidly expanding (Ramasamy, 2018). The growth of subscriptions in fashion is predominately driven by consumers who are increasingly valuing access over ownership; indeed, subscription services improve the diversity of accessible models compared to traditional retail, allowing for greater experimentation with new styles (Fashion for Good et Al. 2019). This model also avoids clothes taking up wardrobe space after being worn only a few times and alleviates users of the burden of disposal after use; indeed, Fig. 84 shows how only 19% of clothing disposal is due to real damages, whereas almost 70% are disposed of only for a matter of size and tastes (Ellen MacArthur Foundation, 2017). Among the most successful subscription-based companies, certainly Rent the Runway is an example, initially set up for online short-term rental of clothing for occasion wear and high-end luxury garments and then expanded as a monthly rental subscription model in 2016 (Pr Newswire, 2016). The company offers 3 different subscription plans ranging from the basic one of $ 69 / month, with which users can access a limited product portfolio and can claim only 4 items per month, to the $ 149 / month plan, in which users can claim 16 items per month and have access to any product on the site (Rent the Runaway, 2021).

Other companies instead propose subscription boxes; for example, StitchFix offers a monthly clothing and styling subscription service. By subscribing to this service, users receive a box each month containing clothes chosen by the company based on some quizzes made while subscribing and updated with the interactions on the site. If among the products received something is valuable for the user, it can be purchased, otherwise, sent back all the products for free (StitchFix, 2021). These businesses often make use of tailored services (e.g., stylists) and aim at creating a sense of identity rather than relying on functionalities or price alone (Catulli et Al. 2017). Fig. 85 shows the potential of subscription-rental that appears as viable in 3 of 4 fashion segments. Beyond the Value Market, estimated margins are largely consistent with those for traditional retail.

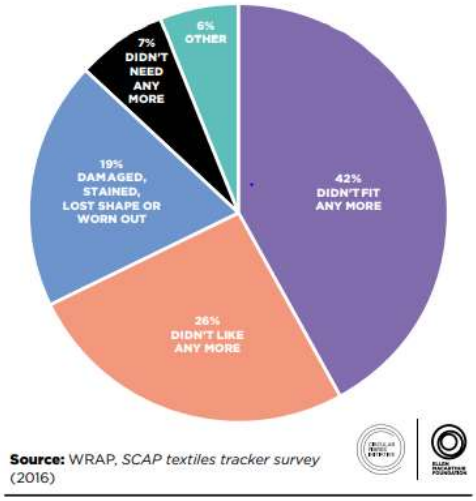


Fig. 84 – Reason for disposal or donation or sales of clothing in UK. Source: WRAP, 2016.

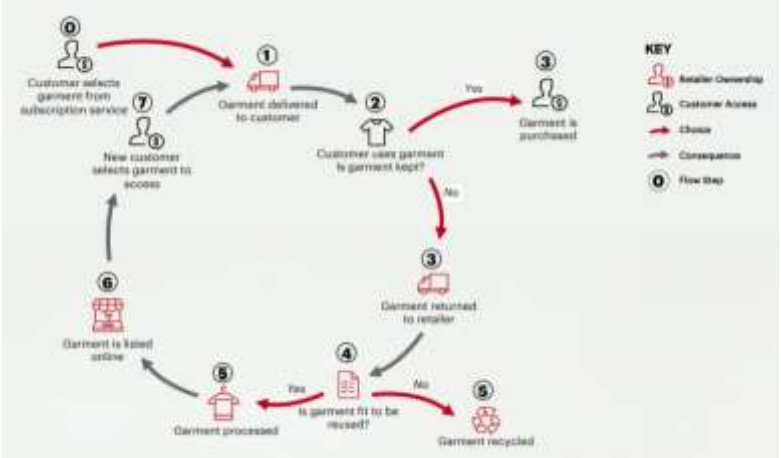


Fig. 83 – Visual representation of the Subscription-rental model. Source: Fashion for Good, 2019

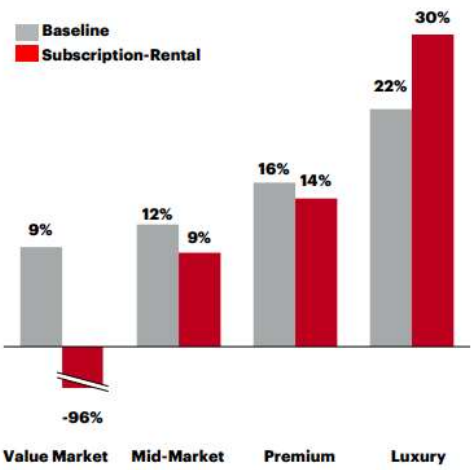


Fig. 85 – Subscription-Rental margin by segment vs baseline. Source: Fashion for Good, 2019.

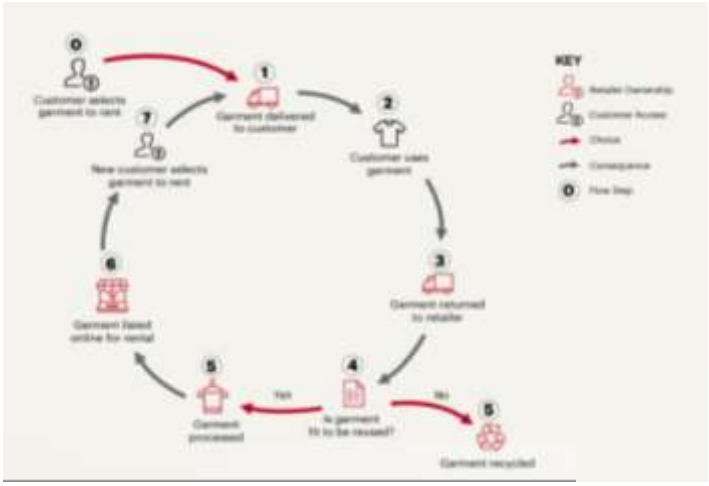


Fig. 87 - Visual representation of the Rental model. Source: Fashion for Good, 2019.

Given a flat monthly subscription fee, the total number of times a garment is exchanged during a subscription becomes a critical factor in determining viability. For the Mid-Market more than 15 exchanges per subscription would lead to the margins being lower than the current baseline and with more than 25 garment exchanges, the model would lose money. For Premium Market the equivalent exchanges are only slightly higher, 17 for margins lower than the baseline, and 28 to drive a negative result. This sensitivity is linked to new variable costs, including postage, packaging, laundry, and manpower, which are incurred for every exchange with no additional revenue uplift. The challenge is to ensure a balance between offering convenient, customer-centric models while optimizing associated costs (Fig. 86) (Fashion for Good et Al. 2019).

The advantages brought to the brands by this kind of model are quite evident and relevant. Subscription services help create brand and product exposure, develop a closer and potentially long-lasting customer relationship based on loyalty, and provide a consistent revenue stream. Rental can also enable companies to gather valuable customer information directly and to improve products and services through feedback loops (Ellen MacArthur Foundation, 2017). However, the benefits of this business model can be partially offset, since they depend mainly on the displacement rate. This will be especially important as Subscription Rental is scaled, with a potential risk that overall consumption could increase if uptake of the model takes place alongside traditional linear fashion. If the subscription models become supplementary to existing consumer purchasing, this will only increase volumes of production and consequent waste (Fashion for Good et Al. 2019).

Short-term rental is a model where customers rent garments for one-off occasions and needs (Fig. 87). This model allows fighting above all waste generation, suffice it to think that 50% of items in a customer's wardrobe are unworn (Elven, 2018), creating an estimated $ 30 bn worth of unworn items in the UK wardrobes alone (Wrap, 2017). Successful examples of companies adopting this model already exist. Rent the Runway is a notable example in the U.S., renting more than $ 800 million in retail value of clothing in 2014 when their business model revolved exclusively around occasion wear (Vasan, 2015). Apart from unworn clothes for tastes reasons, 42% of items are disposed of because they no longer fit, which opens great opportunities for short-term rental (Ellen MacArthur Foundation, 2017).

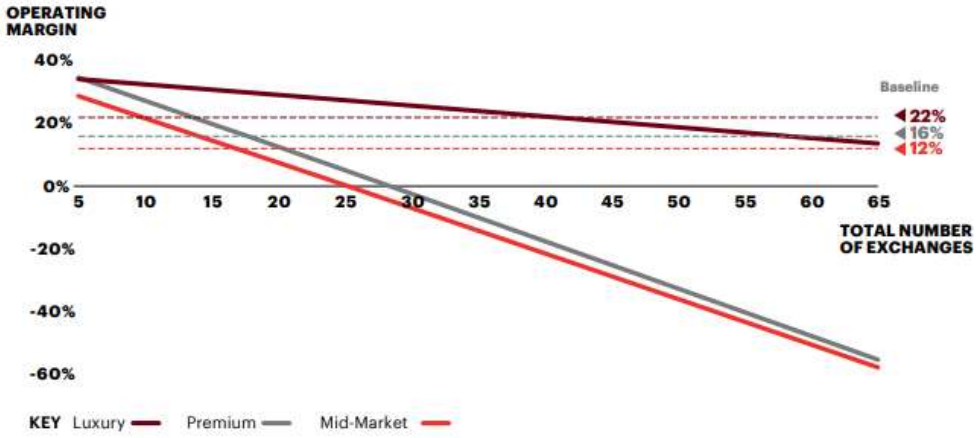


Fig. 86 - Operating margin as a function of the total number of exchanges. Source: Fashion for Good, 2019.

This opportunity is especially true for those product categories where the size changes frequently, such as baby and children's clothes and maternity wear. The Danish company Vigga, established in 2014, allows parents to access high-quality baby clothing for a fraction of the cost of buying new (We-economy, 2018). The short-term rental is also adapted to sports equipment, such as the case of the company Houdini sportswear. This company creates an attractive financial model for both the brand and the customer, who can afford high-quality performance sportswear for one weekend or week for 10 – 25% of its retail price, rather than buying a cheaper, lower quality version or needing to store the garment for the rest of the year unworn (Ellen MacArthur Foundation, 2017). Rental appears to be very attractive especially for Luxury, with a potential margin of more than 60% per garment, three times the operating margin of luxury traditional purchase; this is driven by a very high number of possible rentals per item if compared to lower value products. For all the other segments, rental appears to be unprofitable; the problem is the high variable costs incurred each rental, relative to the low price-point for purchasing a new product (Fashion for Good et Al. 2019) (Fig. 88).
The benefits for brands are similar to the previous subscription case. Retailers have little or no insight on what happens to garments beyond the point of sale, with little understanding of how often an item is worn, in what conditions it is used nor what customers think about it. Rental could enrich data insights across each of these dimensions to improve the brand offering (Fashion for Good et Al. 2019).

Figure 11: Rental margin by segment vs baseline

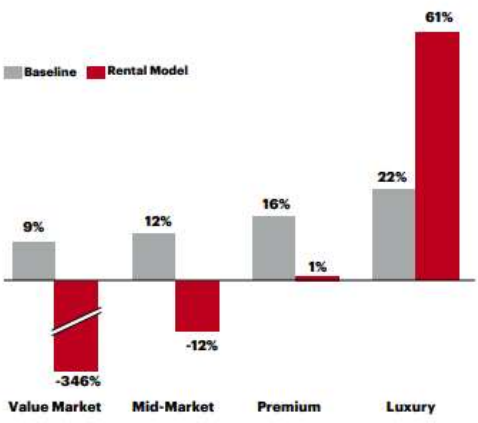


Fig. 88 – Rental margin by segment vs baseline. Source: Fashion for Good, 2019.

One of the main problems that these two models face is logistics and particularly reverse logistics. These two business models are better suited to premium segments; in fact, in this segment margins can cover high shipping costs, would advance logistics optimization, and bring costs down, thus helping to increase scale. Starting with high-end categories can increase brand value and build customer trust, which are useful when expanding rental and resale models into mass-market segments. One of the big costs will be last-mile delivery. For this reason, it will be useful for brands to experiment with different solutions for product pick-up, which could be done at stores, post offices, or local self-service shipment depots. Finally, another problem that could emerge is having mismatched scale problems, since new business models are subscale in comparison to their regular business and require more decentralized smaller-scale distribution processes; outsourcing can solve these challenges. In addition, it will be essential to introduce easy-to-scan product coding that does not wear off with use, enabling both easy trackings of inventory as well as sorting of materials after use (Ellen MacArthur Foundation, 2017).

The main problems that these two models face is logistics. These two business models are better suited to premium segments because margins can cover high shipping costs, would advance logistics optimization, and bring costs down, thus helping to increase scale.

The last model that has been introduced is the *resale* (Fig. 89). Clothing resale is already widely adopted all over the world, particularly through charity shops and online resale, but misses opportunities, in particular in those regions with low rates of clothing utilization, where around 70% of the clothes collected for reuse is sent overseas (Turner, 2021). Provided that clothes are increasingly made to last, introducing attractive resale models suited to a wider customer base locally can have considerable positive impacts (Ellen MacArthur Foundation, 2017). The ThredUp resale report (2019) predicts that the resale market, worth $ 24 billion in 2018, will double by 2023 to $ 51 billion and nearly triple within ten years reaching $ 64 billion; at the same time, fast fashion is predicted to only rise to $ 44 billion (ThredUp, 2019). Resale is the most mature circular business model in fashion today growing at an annual rate of 16%; this growth has been driven by improved access to marketplaces for second-hand garments, with tech-led solutions such as Depop, emerging with a specific focus on millennial consumers (Fashion for Good et Al. 2019). However, retailers will have to work hard to ensure that customers are sufficiently motivated and incentivized to return garments to build the requisite inventory (Fashion for Good et Al. 2019). At the same time, retailers miss out on the potential benefits of owning these channels. Retailers have the opportunity to take some control of their resale market and bring resale into the mainstream. By selling used clothing alongside new clothing, fashion retailers offer an appealing and convenient option. Introducing such resale activity has the potential to be a low-risk and high-reward activity for brands, as it would create additional profits while feeding into the perception of quality, and promoting a brand's interest in increased usage of its clothing a demonstrable commitment to reducing their environmental footprint (Ellen MacArthur Foundation, 2017). Some brands that have managed to positively exploit this new sales channel is Patagonia, with its Worn Wear brand. One of the reasons why Patagonia has such positive results is that the company has always created high-quality products designed for durability (Worn Wear, 2021). Obviously, for many brands, starting from scratch could be very difficult, especially to obtain used inventory and engage customers. So resorting to partnerships with third parties could provide the know-how needed to manage activities such as logistics, renewal, and repair. Such services are already emerging, for example, Patagonia collaborates with Trove that offers white-label resale channels. Trove can purchase, process, price, and photograph second-hand goods before putting them up for sale on clients' websites. Collecting several clients allows one to reach the critical mass needed to make reverse logistics and re-commerce profitable (Trove, 2021). Whereas established brands have traditionally turned a blind or scorning eye towards second-hand retail, they are now wading into the pre-owned and rental markets. For example, Stella McCartney launched a partnership with The RealReal in 2017, offering a $100 credit to consumers consigning her products on the platform. This can create a circular flow that encourages footfall in Stella McCartney stores while building confidence in the quality and longevity of Stella McCartney products (McKinsey et Al. 2019).

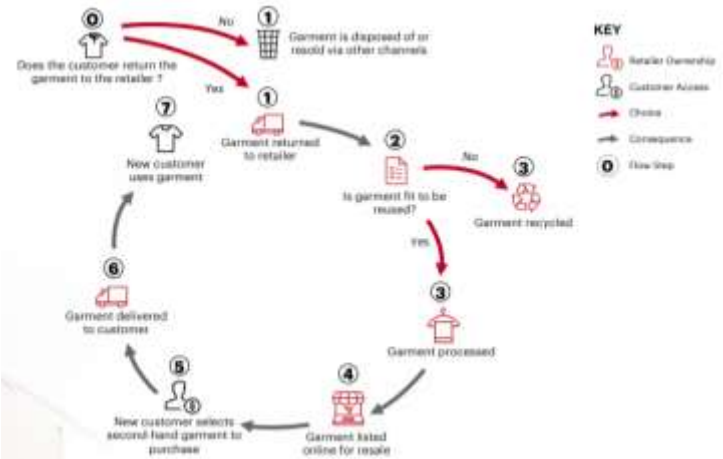


Fig. 89 – Visual representation of the Recommerce model. Source: Fashion for Good, 2019.

By selling used clothing alongside new clothing, fashion retailers offer an appealing and convenient option. Introducing such resale activity has the potential to be a low-risk and high-reward activity for brands, as it would create additional profits while demonstrating commitment to reducing their environmental footprint

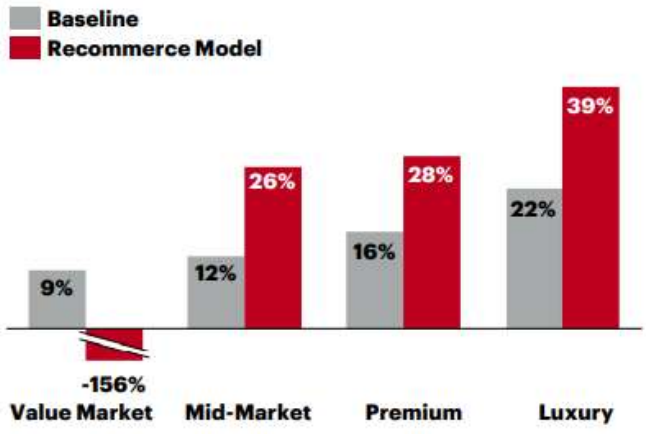


Fig. 90 - Recommerce margin by segment vs baseline. Source: Fashion for Good, 2019

From an economic point of view, resale appears to be the most financially viable circular business model, with profitability exceeding the baseline in Mid-Market, Premium, and Luxury segments. This is intuitive, given the relative operational simplicity of a resale model in comparison to the other models explored (Fig. 90). Luxury would appear to represent the biggest opportunity, while new variable costs associated with each model make the Value Market consistently challenging. The cost of acquiring a garment from the original customer is a critical driver of profitability.

These costs include both the direct compensation paid to the original customer and the costs of collecting the returned garment. Garment quality must improve. Garments need to be durable enough to be worn more than 20 times to be suitable for resale. This number should be identified as a target for retailers to aim for, either designing products with this as a minimum threshold. To try to reduce the costs of logistics, retailers could reduce inventory acquisition costs through a network of collection points, ideally combined with in-store drop-offs, while a price threshold for free delivery can be strategically considered to pass on some final distribution costs (Fashion for Good et al. 2019).From an environmental point of view, resale is clearly valuable, since it extends the lifecycle of a garment by an average of 2.2 years, potentially reducing its water, carbon, waste footprint by 73% (Circle Economy, 2019). Furthermore, if adopted at scale, resale could shift customers' perception of garments as retaining value rather than losing value with use. Rental could play a critical role in shifting the industry towards a less resource-intensive model, through incentivizing higher production standards and greater garment longevity. Purchase displacement rate must be considered as a key metric when assessing potential environmental benefits (McKinsey et Al. 2021).

4.13. CONCLUSIONS

This chapter has shown us how unsustainable the world of fashion is and the areas that offer the greatest opportunities for improvement on which to act with an integrated approach to sustainability, taking into account environmental, cultural, economic, and social perspectives.

What is very clear from this chapter is that today it is totally unsustainable and no longer suitable for companies to adopt a business model based on fast fashion and a global supply chain. This model, which has been dominating during the last 30 years, has created an extremely polluting industry. Not only that. The search for price reduction has led to an extremely unbalanced supply chain. The initial phases of production are concentrated in developing countries, while the phases of consumption, and the main benefits and wealth resulting from sales, are concentrated in Europe and North America, leaving Asian countries to carry the burden of the excessive environmental and social costs of the whole industry.

From an environmental point of view, the areas for improvement are vast, and this represents an opportunity for companies to invest in more sustainable resources and processes. Among the most polluted resources, we have water, used for spraying the fields and in the production phases where it is often polluted by microplastics, chemicals, and GHG emissions, which have contributed 4%. If we go through the phases of the value chain, we have seen that the design phase is often undervalued because it usually does not imply direct significant environmental costs, but it has fundamental implications on the life of the product: from the choice of the fibers to be used, to the chemical treatments it must undergo, to the choice of packaging, up to the disposal phase, where we have seen that 1% of products are recycled, while around 12% are used in other processes and the other products are incinerated or end up in landfills.

From a social point of view, the most critical areas are safety at work, minimum wage, child labor, and working conditions so precarious as to be defined as "modern slavery". Given that most production is concentrated in offshoring, companies can achieve improvements by placing greater controls on suppliers.

As far as cultural sustainability and cultural appropriation issues are concerned, what companies need to do is to exploit their position and become a means by which the masses can come into contact with new cultures and other countries. Considering also the delicacy and difficulty of the topics dealt with, it is important to have within one's corporate structure figures dedicated to the control of these issues, such as the case of Gucci and the diversity officer.

In the current state of companies section, we showed some of the key industry valuation benchmarks, and both indicators emphasize that there is a long way to go to improve the situation. We note that currently, more than the price range, it is the size of them that matters most, with large companies being the most sustainable in every market. The giant sports players are the category with the highest score, thanks to a long tradition of focusing on materials and in-depth collaboration with various tiers of their supply chain. Also important is the performance of the fashion giants who, thanks to their considerable financial resources, manage to carry out numerous initiatives along the supply chain.

Given the unsustainability of the fashion model, pressure has increased from various stakeholders and NGOs, and governments have begun to issue increasingly stringent international policies for organizations such as the achievement of climate neutrality by 2050 in the Green Deal. We expect this trend to continue, with organizations becoming increasingly accountable and able to produce as sustainably as possible. This is also reflected in the evolution and importance that CSR or organizations such as benefit corporations have had in recent years.

The need for more sustainable business models that oppose the traditional linear logic of fashion, has seen the emergence in recent years of business models based on circularity. These disruptive business models were often born from start-ups that have grown and established themselves quickly, and that have forced even incumbents, initially reluctant to take this path, to look at these models and integrate them into their strategy.

CHAPTER 5

REFLECTIONS UPON THE SUPPLY CHAIN

In this fifth chapter we have focused on the fashion value chain reflecting on the catalytic effect that Covid-19 had in transforming B2B relationship and moving the industry towards a 4.0 paradigm.
Indeed the pandemic has put increasing pressure on global supply chain, showing the lack of flexibility and resilience. It also highlighted the potentialities of digital solution. To cope with restrictive measures many processes have been streamlined, with a positive effect also on costs. Virtual sampling streamlines product development avoiding the production of physical samples which results in a 35% reduction in time to market and make it possible to satisfy the desire for customization typical of Gen Z. With digital showroom brands can present collections and collect orders online. Moreover, B2B ordering platforms allow to serve small customers in a convenient way. Digital technologies adoption has a positive effect on production costs, which shrinks the gap with manufacturing hubs that offer low labour costs exploiting social inequities. This is why nearshoring has accelerated during the pandemic, with the goal of improving the resiliency of value chain. Though shorter supply chain are beneficial collaboration across the value chain is crucial for achieving a flexible, consumer-centric supply chain and making industrywide progress towards social and environmental sustainability.
The Industry 4.0 concept should be viewed today, as a way to transcend the manufacturing-centered vision to embrace a new system made of combination of “smart factories”, “smart networks” and “smart products”. Smart factory model improve efficiency and sustainability of production by blending human unique attributes of creativity and manual dexterity with digital technologies and devices. The upstream supply chain is under investigation by consumers, who are demanding greater transparency on issues such as labor, environmental pollution, and fair labor. New technologies such as blockchain can boost transparency among all the steps in the supply chain, creating smart networks of partners rather than supplier-buyer relationship. Finally, smart products connect supply chain with final users extending interactions beyond purchase. The metaverse, for example, is a parallel reality that acts as a mirror of the real world, where users can work, play, and communicate among them and with brands. Artificial Intelligence makes it possible to simplify the user experience at the moment of purchase, adopting the logic of "recommendation" and "next best offer", driving revenue growth of 10 to 30 %.

KEY FINDINGS

1- Digitalization of design phase can reduce time to market until 35%

2- The gap between the hourly manufacturing labor costs from 2005 to 2017 between China and Turkey has decreased from 5 to 1.6 times thanks to digitalization of supply chain

3- 64 % of work has the potential to be automated by adapting currently demonstrated technologies which this represents 231.3 million people in 50 countries across the world

4- The solely digital clothing is expected to reach a $ 190 billion market by 2025

5- AI can increase gross value added by more than $ 2.2 trillion in the wholesale and retail industry by 2035 which corresponds to a 59 % increase compared to the steady-state

6- AI the enhanced user experience could create long-lasting customer loyalty and drive revenue growth of 10 to 30 % and reduce of forecasting up to 50%

5.1. PANDEMIC PRESSURE ON VALUE CHAIN

At this stage, it should be quite clear that the pandemic has pushed e-commerce and that pure digital players are getting a relevant advantage in this new context. However, the phenomenon of digitalization has been going on for a long time and its evolution is a topic for lots of predictions. As for fashion, one might immediately think that the main area of transformation regards the channels reaching final users. In reality, the most relevant changes have occurred in the Business-to-Business (B2B) relationship, especially after the pandemic has brought to light a series of critical issues.

The first problem is the inventory levels, already extremely high before the pandemic. A common strategy to reduce stock levels was promotions and discounting: only 60% of products were sold at their original price (McKinsey et Al. 2020), with notable repercussions on lost margins. The generalized lockdown periods have made the situation worse, with inventory turnover falling by 33% in the first three months of 2020 (McKinsey et Al. 2021) and orders down nearly a third year-on-year by the end of April (Guilbert et Al. 2020). The value of excess inventory from Spring - Summer 2020 collections are estimated at € 140 to € 160 billion worldwide (between € 45 and € 60 billion in Europe alone), more than double compared to normal levels for the sector (Gonzalo et Al. 2020). Furthermore, the pandemic has reshaped consumer buying attitudes, making people become more price-conscious (Bona et Al. 2020): 60% of consumers report spending less on fashion during the crisis, and approximately half expect this trend to continue after the crisis (Granskog et Al. 2020).

Certainly, this attitude will not help reduce the inventory but will magnify the problem. Another major phenomenon that we introduced in Chapter 3 is the growing confidence in the use of technology by consumers for information, shopping, and leisure. The importance of social media underscored something that is not often as clear; today trends are dictated more by consumers than by retailers and editors (McKinsey et Al. 2019). Barbara Pagani, sales and marketing assistant for Gerber Technology, in an interview with Fashion Magazine, said that “the supply chain is now reversed: the input does not come from the stylist but e-commerce, from those who make the order that they want to customize.

As demand uncertainty, and sales volatility increase, supply chains must become more demand-driven to operate flexibly along the value chain

You will no longer go to produce and make the warehouse without knowing what the market wants, but you will need maximum agility and communication between the parties". What is being perceived is a major shift in the paradigm of the supply chain; products are "pulled" by the market rather than "pushed" by companies. In this way, best-guesses and forecasts are avoided and the industry is moving towards a more on-demand model (McKinsey et Al. 2019). As demand uncertainty, and sales volatility increase, supply chains must become more demand-driven to operate flexibly along the value chain; this includes the product development process, which can reduce lead times and adapt more responsively thanks to a deeper understanding of customers’ trends and needs.

Fig. 91: Innovations that have been scaled-up thanks to Covid along the fashion value chain.
Source: McKinsey et Al. Update, 2020

The crucial ingredients of a demand-driven supply chain include segmented assortments with smaller batches, increased transparency, removal of functional silos, use of highly efficient processes supported by tools and analytics, and use of dual sourcing and nearshoring (Haug et Al. 2020). To address and solve all these issues, digitization turns out to be very useful. The fashion industry has indeed invested heavily in digitization during the pandemic period, as an executive from an apparel leader company recently said "We accomplished two years of digital transformation in two months" (Gonzalo et Al. 2020). Fig. 91 summarizes the areas where the greatest changes occurred.

Design

In the design phase, there has been increasing interest in 3D product development and prototyping technologies. They have been fundamental during the pandemic period to cope with remote working facilitating communication and circulation of ideas. These solutions, once thought to be costly and time-consuming, can greatly increase the potential of creation as they enable the digitization of processes and move data from one stage of the factory to another. Cad 3D software is becoming increasingly sophisticated with larger databases that consider material characteristics, such as elasticity and thickness, and can contain information on sustainability and supplier certifications. Moreover, these solutions allow for rapid experimentation. According to Daniele Manassero, 2D and 3D patternmaker at Miroglio Fashion, "what strikes you most at first glance is that you can quickly visualize an idea in three dimensions and modify it, without cutting even a centimeter of fabric. You can experiment with countless patterns" (Fabbri, 2020). In this way, it is possible to make a few physical prototypes and then see all the possible variations digitally, modifying the components. All this is also enabled by the development of technologies such as avatars. In fact, it is no longer strictly necessary to make people physically wear clothes but technologies such as that developed by Metail, which allow customizing a virtual item based on a personal avatar.

Merchandising & Planning

One of the activities that can enjoy the greatest benefits is the merchandising process, which consists in multiplying the versions of each original item through variations of construction, material, colors, and details. This allows offering retail buyers the opportunities to directly access the catalog from remote, highly customize their orders, without any sample collection being produced and delivered to physical showrooms worldwide (Bertola, 2021). The advantages of using this type of solution are not only organizational or necessity-related but bring significant time and cost advantages. For example, the sampling phase can be streamlined through virtualization; there is no longer a need to produce many physical samples and yardage samples of fabric and to wait for products to be transported from Asia to Europe for approval. Customers can visualize online the virtual samples and order directly (Bobrowski,2020). Some providers were already talking about a 35% reduction in time to market and a sharp cut in costs for prototypes: to put a single garment into production, it seems only one or two samples are needed, from the five or six needed on average for traditional production (Fabbri, 2020). These technologies also make it possible to satisfy the desire for customization typical of the new Gen Z customers. In fact, many companies are investing to offer 3D con urators even in e-commerce (McKinsey et Al. 2018).

Virtual sampling streamlines product development avoiding the production of physical samples which results in a 35% reduction in time to market and a sharp cut in costs. These technologies also make it possible to satisfy the desire for customization typical of Gen Z.

B2B Sell-in

The digitization of wholesale has been much slower than its consumer-facing counterpart, but a key digital tool for shortening the sell-in period is the digital showroom. Leveraging these technologies, companies can present their collections digitally and take orders directly from customers online, saving on the considerable physical samples and high-intensity travel to traditional trade shows and fashion weeks, overcoming that enduring belief in the need to touch and feel, as well as the importance of first-hand examinations of fabric, fit, and cut (Hall, 2020). In addition to this, there has been an increase in new B2B practices, such as the implementation of business-to-business (B2B) ordering platforms. These portals allow them to serve smaller customers in a more convenient way (Berg et Al. 2018). For example, during the pandemic period, Chinese showroom agency DFO used live streaming during Paris Fashion Week to reach buyers in China and engaged twice as many people as normally traveling to Europe. The resulting orders, 95% of which were digitally placed, reached 80% of the agency's sales targets (Hall, 2020).

Sourcing & Supply Chain

The coronavirus has shown even more the weakness of the current global value chain. The first lockdowns that occurred in Asia at the beginning of the China pandemic halted the production of entire industries. Fashion companies have understood that they must intervene to modify their sourcing mix to better balance risk, costs, and supply flexibility. For this it is accelerated that process that was already in action from time and called like nearshoring, that is to approach the own suppliers towards the places of production. The impact of COVID-19 has already led to short-term sourcing mix disruptions. In fact, it is expected that China's role as a leading raw material supplier may be challenged following the collapse of the first quarter of 2020 when delays in raw materials have highlighted more the need to have stronger backward integration of regional supply chains (Berg et Al. 2018). Moreover, if once upon a time brands moved to Asian countries mainly attracted by low manufacturing costs, this is no longer the case today. Mexico for example offers average manufacturing labor costs lower than China, while hourly manufacturing labor costs in Turkey were more than five times higher than those in China in 2005, in 2017 the gap was only 1.6 times. (McKinsey et Al. 2019). Turkey is the country that McKinsey's survey found will benefit most from this new situation, with 43 % of European sourcing executives expecting an increase in value share there (Berg et Al. 2018).

With digital showroom brands can present collections and collect orders online. B2B ordering platforms allow to serve small customers in a convenient way. Nearshoring has accelerated during the pandemic with the goal of improving resiliency of value chain.

The advantage of using this kind of solution is in the decrease companies can produce more closely in line with demand, reducing overstocks and increasing full-price sell-through (McKinsey et Al. 2019). To try to reduce as much as possible the gap with labor costs in Asian countries, companies have invested heavily in autonomy, which will play an important role in increasing labor efficiency, throughput, and flexibility. Its most advanced economies such as the US and Western European countries are also turning to automation to remain competitive and to overcome the economic growth gap caused by their own aging workforces. The latest technologies seem to have overcome even that limitation to robots used in the clothing production process, due to the characteristics of the material, such as being soft, elastic, and fragile (H&M Foundation et Al. 2018). Certainly, sewing will benefit from among the technologies that will have the biggest impacts will be sewing, currently the most labor-intensive step in creating a garment, which right now accounts for more than half the total labor time per garment, but more than 90 % of the sewing of simple garments can be automated. The other process after sewing that is extremely labor-intensive is the picking stage, which is often subject to errors. Robotics in intralogistics throughout the production process, as well as warehousing, can halve labor intensity, reduce processing time and errors, and improve worker ergonomics.

Technologies in the market today include overhead garment-on-hanger systems, which utilize the previously empty overhead space in a warehouse to store, sort, and pick display-ready garments, and self-driving warehouse vehicles. Knitting can also be highly autonomous, thanks to the use of technologies such as computer-controlled or 3-D knitting. These technologies not only allow for a reduction in waste material, such as Nike's Flyknit product line which reduces it by 80% but also allows for customization and improvements in design and fit. These make knit garments more versatile and increase the garment's commercial value. All of this taken to the extreme could lead to single-item production. Emerging gluing technology will allow companies to completely bypass sewing while adding functionality to performance garments. However, the times when only outdoor brands used adhesive technology to improve water resistance are gone. Gluing today is also used in the high-end design segment. Combined with robotics, gluing and bonding have the potential to significantly reduce labor and increase production speed. Finally, the finishing phase, where all those activities take places such as digital printing, or the abrasive actions on the jeans where the labor can be reduced respectively of up to 70 % and abrasives by up to 90 %. Levi's laser technology drastically cuts finishing time for a pair of jeans, from 20 minutes to 90 seconds"(Andersson, 2018). McKinsey Global Institute (MGI) recently estimated that 64 % of work has the potential to be automated by adapting currently demonstrated technologies; this represents 231.3 million people in 50 selected countries across the world in 2016. An extreme example of autonomation is the Adidas Speedfactory, which features fully automated production and is capable of producing 500,000 pairs of shoes per year. It also allows for localization directly within the market in which it will sell, which will allow it to adapt better and faster to demand, and due to the strong level of autonomation, the Speedfactory will be able to customize faster and smaller batches of products and offer customers a broader product range (Citiroglu, 2017). Another very relevant aspect that makes this new nearshoring model preferred is that the offshoring model is hardly compatible with the new need for speed.

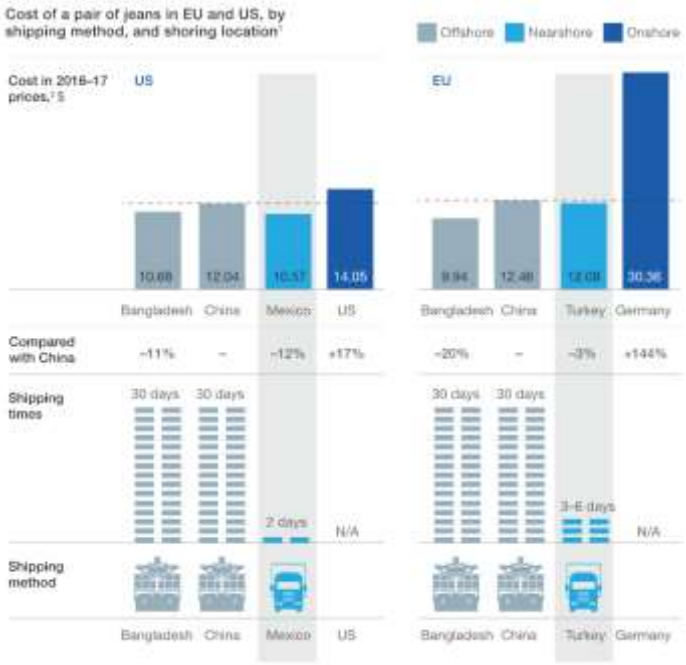


Fig. 92: Savings on freight, duties, and time make nearshore cheaper than China. Source: Andersson et Al. 2018

Collaboration across the value chain is crucial for achieving a flexible, consumer-centric supply chain and making industrywide progress towards social and environmental sustainability.

Shipping inventory from Asia via sea to Western markets typically takes 30 days (Fig. 92). Such a long lead time eliminates any possibility of flexibility and differentiation. Airfreight is an option, but an expensive one; it is also not environmentally friendly, a consideration that will increase in importance. The benefits of offshoring could shrink even further given geopolitical tension, which is driving uncertainty in trade agreements and exchange rate developments. Decisions about the future production footprint of each product type should be based on two main criteria: the cost reduction from nearshoring and the commercial value of reducing lead times. Shorter lead times will have high commercial value for on-trend items. As a company gets items into stores faster, it will be able to test and scale more styles. Not only will it be able to boost sales volumes and sell-through rates, but the company can also reduce inventory levels and mitigate the brand dilution resulting from markdowns and clearances (Andersson, 2018).

To achieve relevant goals, it is necessary to engage suppliers and develop strong supplier partnerships. Collaboration across the value chain is crucial for achieving, a flexible, consumer-centric supply chain and making industrywide progress towards social and environmental sustainability. True strategic partnerships are relationships that encompass joint strategic goals with potential (co-)investments for optimization of end-to-end processes and require collaborative innovation to drive digitization. Moving forward, strategic partnerships with advanced suppliers will be crucial in the demand-driven, sustainable sourcing paradigm. In driving innovation in R&D and sustainable production processes and technology, Industry 4.0 for traceability and efficiency improvements, and in technology for mass customization (Berg et Al. 2018).

This requires apparel companies to establish professional supplier evaluation and development processes, along with investments for strategic suppliers. The industry's traditional emphasis on supplier identification, transactional negotiations, and manual order management will not serve it in the future. Instead, companies need to adopt an end-to-end perspective and foster collaboration across functions and through strategic partnerships with suppliers. Greater agility and flexibility are critical if companies are to give savvy customers what they want, when they want it, where they want it, and at the right quality (Lange et Al. 2017) (fig. 93).

The industry's traditional emphasis on supplier identification, transactional negotiations, and manual order management will not serve it in the future. Instead, companies need to adopt an end-to-end perspective and foster collaboration across functions and through strategic partnerships with suppliers.

Nearshoring and supplier partnerships have found digitalization and autonomy to be the main ally for their development that allows them to be faster, more flexible, and d offset higher labor costs in near- and onshore production (McKinzey et Al. 2019). Technologies and processes successfully implemented during the crisis will have a profound effect on the industry's future. Fashion players need to identify, prioritize, and scale up innovations that worked and benefited them the most during the crisis. Implementing a test-and-learn approach will be critical in a new world where agility and sustainability are of the essence (Berg et Al. 2018).

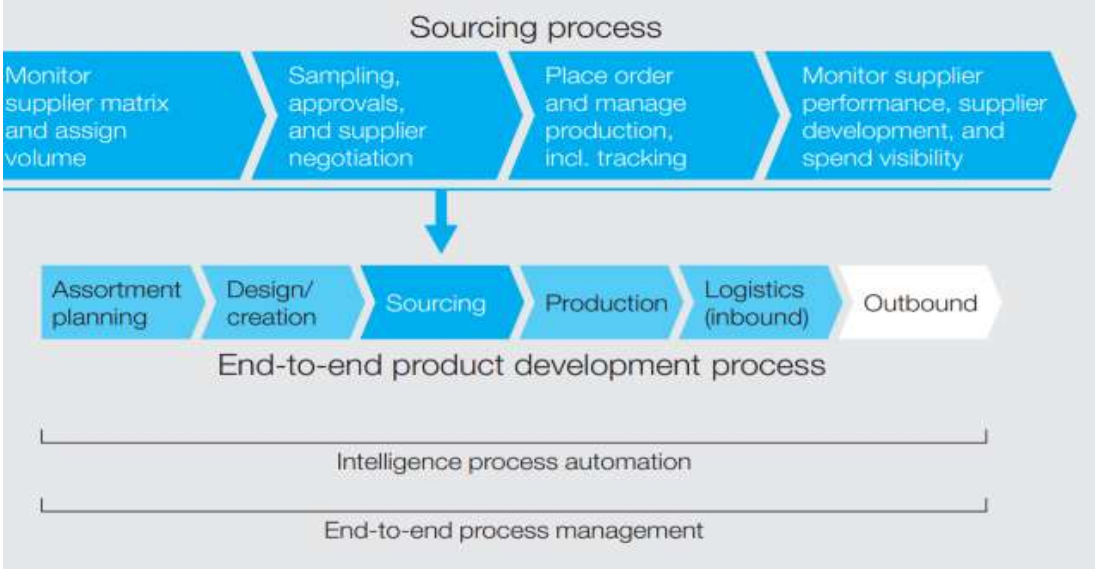


Fig. 93: Digitization of sourcing goes beyond digital adaptations of manual sourcing processes and impacts the full end-to-end product development process. Source: Lange et Al. 2017

Consumer Engagement

A final aspect that we would like to examine is that of virtual shows, which have had to adapt to new modes of fruition during this pandemic and which are likely to persist. In fact, in recent years the Fashion Week has been a growing pain point for the industry from a sustainability and investment standpoint with many viewing it as an antiquated resource vacuum. It will be up to bigger players to rethink the fashion cycle and catalyze real change by adopting new digital formats and setting an example for the rest of the industry (McKinsey et Al. Update, 2020). Another way brands are streamlining their assortment is by breaking the shackles of the traditional fashion calendar. Indeed, the current number of collections across the seasonal calendar is increasingly seen as an impediment to a demand-focused approach. As luxury players focus their energies on fewer yearly collections, some are shifting away from cruise and resort collections. As the trend continues into next year, brands heavily reliant on these inter-seasonal collections will face the challenge of having to adapt to a reduced fashion calendar. Gucci announced it would be scaling back the rhythm of its collections from five to just two per year, reflecting a growing movement toward seasonless fashion among retailers (McKinsey et Al. 2021).

The current pause in retail presents an opportunity to reinvent the cadence of the fashion system, realign seasons, and reduce overproduction, relax seasonal drops to minimize price reductions, wastefulness, and inventory costs.

The current pause in retail presents an opportunity to reinvent the cadence of the fashion system, realign seasons, and reduce overproduction. The crisis allows industry leaders a unique moment to evaluate the lifespan of current collections and relax seasonal drops to minimize price reductions, wastefulness, and inventory costs. (Arici et Al. 2020).

5.2. ACCELERATING TOWARDS 4.0

What has emerged from the previous paragraph is that Covid has been an engine that has forever changed the way the fashion business is done and has certainly facilitated the transition to Industry 4.0. The term "Industrie 4.0", shortened to I4.0 or simply I4, it has been used for the first time in 2011 in a project in the high-tech strategy of the German government, which promotes the computerization of manufacturing. Realized in late 2013, the Industrie 4.0 project for the industry of the future included investments in infrastructure, schools, energy systems, research institutions, and businesses to modernize the German production system and bring German manufacturing back to the top of the world by making it globally competitive (BMBF, 2016). Since this initial implementation, many other governments have championed it with a series of laws. This is the case of Italy, France, and Germany, which in 2017 initiated trilateral cooperation to promote the digitization of the manufacturing sector and to support the European Union's efforts in this area. The cooperation brings together the implementing bodies of the national strategies for Industry 4.0, Plattform Industrie 4.0 for Germany, Alliance Industrie du Futur for France, and the Piano Impresa 4.0 for Italy, which signed a joint roadmap in Turin on 20 June 2017 (Mise,2017). The policies are based on pillars that can be summarized in four points. The first is that they must support digital investments. The second is that they must improve the skills of workers, the third the digital infrastructure, such as 5G and finally support digital services through mechanisms of competence centers and digital hubs. To do this, there are mechanisms to support digital investments, such as patent boxes, fiscal credits for R&D expenditure, and hyper depreciation for the acquisition of machinery and software (Rinaldi, 2019). There are no specifics regarding industry application to refer to, so this plan can also be applied to the fashion world. What emerges from early interpretations of the 4.0 paradigm is that "smart manufacturing" was placed at the center of the processes and was envisioned through a transformation that took place through digitization. However, it is not just that.

It means a system that thanks to digital networks and the interaction between physical and digital can create an integrated system of actors, assets, and stakeholders, where not only supply chains can be real-time tuned with the factory but also retail channels and even products and final customers, can communicate and exchange data within the system (AA.VV., 2016). Consequently, this complex networked ecosystem must also include the upstream manufacturing process (manufacturing process (such as R&D, sourcing, and inbound logistics) and downstream functions (such as outbound logistic, retail, and customer services). In this ecosystem, information can circulate and be exchanged at every level of the organization and throughout its value chain, allowing the creation of a real-time virtual duplication of the whole system (Schwab, 2017), and thus achieving benefits in terms of efficiency, leanness, quickness of response, consistency between customers' individual needs and products-services features. That's why the way the 4.0 concept should be viewed today, as to transcend the manufacturing-centered vision to embrace a combination of "smart factories", "smart networks" and "smart products" (AA.VV., 2016). The world of fashion also fits this paradigm very well. In fact, the fashion industry is a relevant global business, its transition toward "smart factory" models can produce remarkable impacts in terms of more efficient and sustainable production modes. Secondly, it is a "design-driven" industry and that is why it can take advantage of Industry 4.0 technologies, which go from interaction, co-working, and knowledge exchange platforms until on-site production business models, to create a true "smart network" (Ustundag et Al. 2017). When "fashion" merges with "tech" they create "smart products" that can connect physical and digital dimensions into the cyber-physical system, giving the possibility to create new ecosystems between companies, users, and their social environment (Bertola et Al. 2018).

The 4.0 concept should be viewed today, as to transcend the manufacturing-centered vision to embrace a combination of "smart factories", "smart networks" and "smart products"

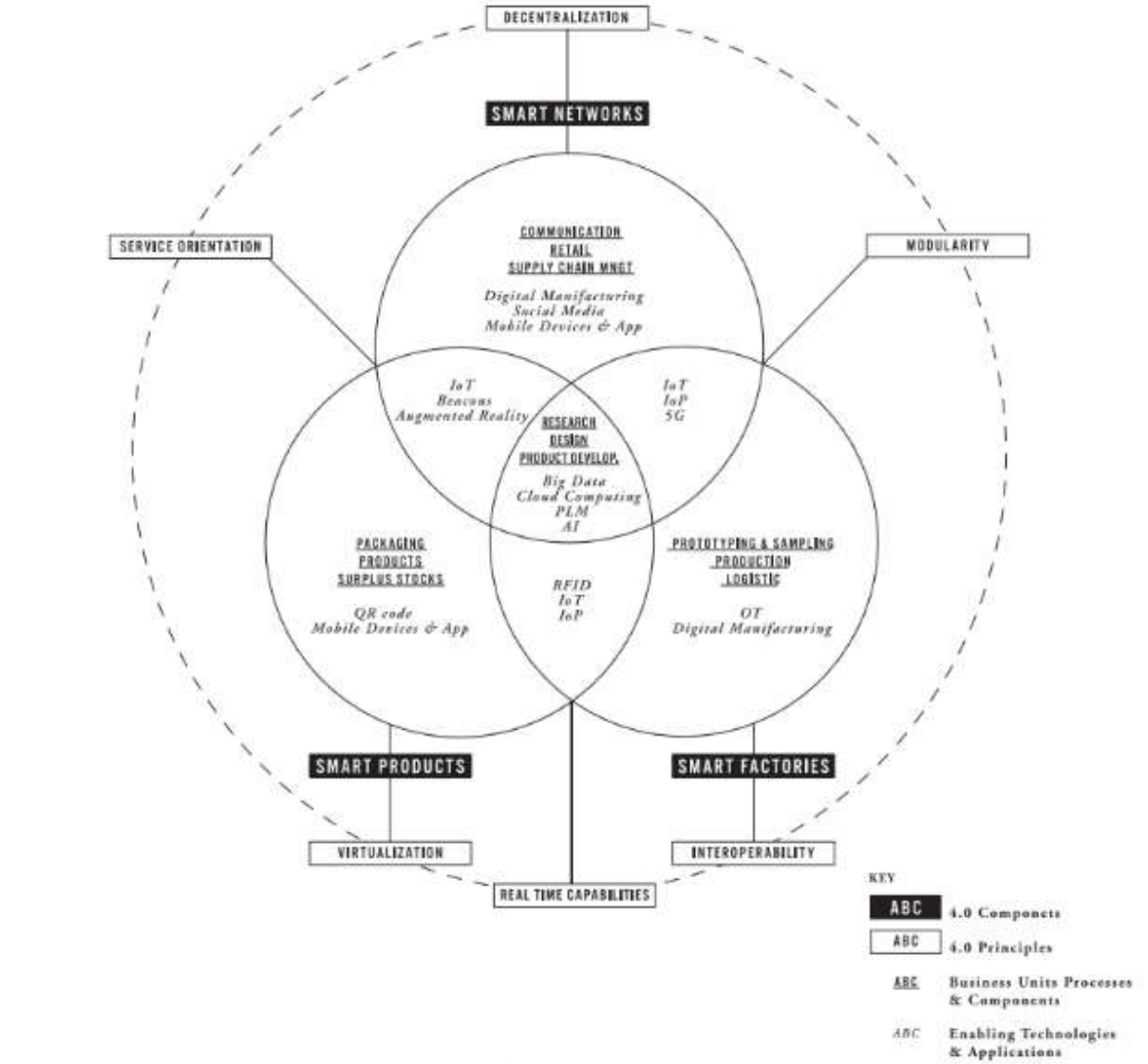


Fig. 94: 4.0 components and principles within fashion business units. Source: Bertola et Al. 2018

Fig. 94 clearly shows us the main areas we have just covered. Now we will analyze each of them identifying the most relevant technologies for each of the phases.

Smart factories

The first one we consider is the *smart factory*, which is defined as "the transformation of the manufacturing process embracing the potential of real-time exchange of data within a paradigm based on a virtual replication of any physical manufacturing operation" (Bertola, 2021). This would allow them to connect in real-time the manufacturing processes with their customers and their retail. It also changes the fashion world's paradigm of working with traditional seasonal cycles. In fact for example one can adapt to changing requirements in seasonal fluctuations or change characteristics in the products system. In addition, the fully virtualized replication of the process can enable the organization into distributed manufacturing plants closer to the market, with enormous benefits in terms of efficiency and environmental impacts (Bertola, 2021). Among the main technologies that fit this new scenario, many are already used for a long time, such as laser cutting or linear-digital printing, and others such as additive manufacturing that can have major potential in leaning and shortening the production process. (Bertola et Al. 2018). Among these, we definitely find 3D printing technologies. One of the main advantages is that 3D printing allows for the local manufacturing of downloadable digital designs into physical objects. (Accenture, 2014). 3D printing also allows the use of sustainable materials, such as PLA (Polylactic Acid)(Flynt, 2019), that are made from plant-based materials and natural lactic acid, 100% biodegradable, or metal-based wire, such as Aluminium, Stainless Steel (Honrubia, 2017).

The immediate application could be the realization of all those accessories of the garment as zippers, buttons...) that because of their low price and complex realization, since they must undergo processes of metallic molding, are often outsourced (Bertola et Al. 2018). Of course, one can also go beyond making simple accessories and make garments. Among the pioneers, we find Iris Van Herpen. In her sculptural designs, Iris van Herpen combines highly refined handwork techniques such as leather craft and modeling metal gauze with innovative techniques such as rapid prototyping and 3D printing by using the latest technologies of the company Materialise. As a pioneer in using 3D printing, she was the very first to present her organic and futuristic collection at the Haute Couture shows in Paris since January 2011 (Materialise, 2013)(Fig. 95). To convince even the most sectarian of the potential of 3D printing, we think it has applications that go far beyond the fashion world. To understand what impacts this technology could have, consider the case of WinSun Decoration Design Engineering Co. The company uses 3D printing to print houses in less than a day using recycled material at a cost of less than $5,000 per home. (Levy,2014). What is noticeable is that the fashion industry is very open to any kind of innovation, but what emerges is a lack of awareness about what are future skills that the fashion industry will need for its human resources (Frey and Osborne, 2013; Frey et Al. 2016).

Fig. 95: Examples of one of the collections of Iris Van Herpen.
Source: Veneruso, 2020

Smart factory model improve efficiency and sustainability of production. It would be more effective to have "augmented" workers and advanced craftsmen able to mix different sets of skills where human unique attributes of creativity and manual dexterity can be augmented by digital technologies and devices.

One problem that companies are facing is how to coauthor the latest technologies with craft manufacturing, which especially in the luxury industries is exploited as a competitive advantage. Some companies fail in their attempt to effectively combine these two aspects.One example is the Zegna brand, which would like to be able to offer customers a true experience of interaction with a personal tailor, who creates a product for them by hand. However, to remain competitive in the market, backstage, they need to manage customers' data and suit production with advanced technologies and only a few handcrafted "touches." This creates a model that we can call hybrid and extremely complex (Vacca, 2015). What is clear from this example, is that it is not possible for traditional craftsmen work together with hyper-specialized engineers, but it would be more effective to have "augmented" workers and advanced craftsmen able to mix different sets of skills where human unique attributes of creativity and manual dexterity can be augmented by digital technologies and devices (Bostrom, 2016; Braidotti, 2008). An example of a model that has succeeded in this integration is that of Velasca, a leather shoe brand founded in 2012. The brand has created a network of local artisans who produce durable shoes to which, through their website, handcrafted details can be added. Velasca has an omnichannel strategy, owning a few physical stores, that work as teasers for their e-commerce, and much of the revenue is invested in artificial intelligence applied to Velasca's platform (Bertola et Al. 2018).

Smart Networks

The second component is *smart networks*, which refers to supply chain management, retail but especially the most important resource for businesses: customers (Bertola, 2021). Considering the whole set of technologies currently available, which goes from interaction, co-working, and knowledge exchange platforms. (Bertola et Al. 2018). Among the most important technologies that can potentially link the entire value chain from suppliers to retail/communication channels (digital and physical) and follow products until their end-life, we found the blockchain, which also solves another of the fashion world's big problems, that of transparency. Consumers have lost confidence in this industry and are clamoring for more transparency from companies, transparency that must be present throughout the supply chain. The problem of transparency in the fashion industry is all the more articulated if you think about the thinking that is often behind certain brands. Businesses wanted to keep their insight into their suppliers and manufacturers as opaque as possible. With the idea that the less you know about your suppliers, the fewer competitors can get the same product and have the same competitive advantage as you (McKinsey, 2019) to add to the very structure of the industry, which relies on very fragmented supply chains often spread across multiple countries where often a great number of retailers do not own their manufacturing facilities or use a system of agents and subcontractors known as “indirect sourcing,” it makes it difficult for companies to monitor conditions across their supply chain. What can usually happen, which exacerbates the situation, is that often happens is that a factory may take an order, only to find that it doesn’t have the capacity to do all the work and, without notifying the brand, the factory owner may then delegate the work out to other factories, which could be unregistered and therefore the kind of place where labor and safety violations occur (McKinsey et Al. 2019). The upstream supply chain is under investigation by consumers, who are demanding greater transparency on issues such as labor, environmental pollution, and fair labor. Already, many companies have realized how important this is. Everlane is one of them. In fact, on its website, there is a list of all the factories engaged in the production of its products, including information related to production places, number of workers, and insights of Everlane employees during visits to these factories, and also posting relevant photos to show their working conditions. Also to support what it claims, customers have the opportunity to visit these factories and showcase transparent operations. As a result, factories have become an important part of Everlane's brand story. With the slogan of "Every factory has a story" (Deloitte et Al. 2020). Price transparency is also important for the consumer, and once again Everlane is among the most virtuous companies. The company, which offers consumers a series of classic and high-quality clothing and accessories at reasonable prices, and firmly believes that consumers have the right to know the whole process, it makes production, transport, and pricing processes transparent on its website and discloses the cost details of each part (Deloitte et Al. 2020).

The upstream supply chain is under investigation by consumers, who are demanding greater transparency on issues such as labor, environmental pollution, and fair labor. New technologies such as blockchain can boost transparency among all the steps in the supply chain.

How does all this demand for transparency in the way brands do business translate? First, players will rigorously audit their business practices to identify potential areas that may erode consumer trust. Businesses can identify areas of high environmental risk by collaborating with their wider supplier network, especially regarding those activities occurring in countries with weaker environmental legislation, known pollution challenges, high deforestation, and/or carbon-intensive energy generation (DHL et Al. 2020).
Surely in the future, more players will highlight their best practices to create a competitive edge. Some will use new technologies such as blockchain, in which each node of the network sees the whole history of transactions, to boost transparency in the supply chain (McKinsey et Al.2019). This technology can be defined as a distributed ledger, or database shared across a public or private computing network.

Each computer node in the network holds a copy of the ledger, so there is no single point of failure. Every piece of information is mathematically encrypted and added as a new "block" to the chain of historical records. Various consensus protocols are used to validate a new block with other participants before it can be added to the chain (Carson et Al. 2018). If someone wanted to hack into a particular block in a blockchain, a hacker would not only need to hack into that specific block but all of the proceeding blocks going back to the entire history of that blockchain. And they would need to do it on every ledger in the network, which could be millions, simultaneously. (The medical futurist, 2018). So, in summary, information is recorded by distributing it among multiple nodes to ensure cyber security and system resilience. The contents of the registry are transparent and visible to all and can be easily accessed and verified. Once written to the registry, the data cannot be modified without the consent of the network (Observers Blog, 2021). This technology has begun to make its way into many areas of retail. One example is Tracr, a platform developed by leading diamond company De Beers. The operation starts with the creation of digital assets representing each physical diamond registered on the Tracr platform. The diamond and digital assets are then transferred to the next participant in the value chain, such as the company that cuts and polishes the diamond. Tracr continues to track the digital asset along each stage of the diamond's journey, from manufacturer to retailer and finally to the end consumer, and consequently subsequent sales.

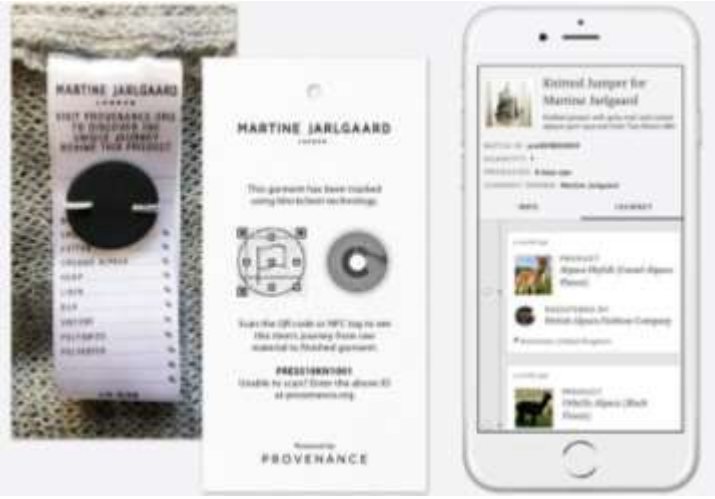


Fig. 96: Martine Jarlgaard collaboration with Provenance to show to customers the item's journey. Source: Arthur, 2017

In addition, this solution solves an issue that has created problems for the company's image in the past. In fact, the blockchain ensures that the diamond does not come from conflict zones where gems could be used to fund violence (de Beers Group). In the fashion world, this technology has not yet managed to develop its full potential, but every year there are more examples of companies deciding to integrate this technology within their processes. One example is that of London-based designer Martine Jarlgaard who has partnered with blockchain technology company Provenance (Fig. 96). As in the previous case, each dress has a unique digital token, which makes it unique in the network, enabling Provenance to verify every step of its production and create a digital history of that information including location data, content, and timestamps, all of which is presented to consumers via an interface they can access through their item's QR code or NFC-enabled label (Arthur, 2017). The consumer can thus have access to information on the origin of raw materials and producers. Another problem that can be solved is the lack of consumer trust, in fact, according to Compare Ethics report, just 1 in 5 shoppers trust brands' sustainability claims. Provenance offers The Transparency Framework, which helps brands connect with third parties who can verify and certify the company's actual impact. (Provenance). Another aspect that is often overlooked when talking about blockchain is storytelling. Instead of simply presenting the final product, you can tell the story of the product, its workings, the people who took part in it, all in a very visual and engaging way. (Arthur, 2017). As we have seen, blockchain, with its distributed database protocols, enables a complete audit trail across the fashion value chain (H&M Foundation et Al. 2018). In addition, IoT enables connected clothes across the same value chain, to give rise to a truly connected supply chain. For example, we can equip objects with RFIDs tags o beacons, the inventory provides opportunities for instant traceability, improved inventory management, and automated recycling. Naturally, a connected supply chain also generates vast digital information, where analytics can be used to establish circular insights that enable more predictive ways of working (H&M Foundation et Al. 2018) to drive businesses toward true smart networks.

Smart products

The last component of Industry 4.0 is *smart products*, which refers to both the product development phase and the product itself. The complete digitization of the early stages of development allows to completely replace physical processes with virtual ones. As we have seen in the previous paragraph this allows, cutting out entire production cycles of physical objects, such as prototypes and, sample collections but the most important issue, is that this virtualization allows the real-time exchange of data. The virtualization of processes and the development of design phases have opened a lot of new opportunities for the fashion world. A first example is the development of apps for body scanning, which can measure the customer's measurements and offer the right product for him. The greatest potential of these apps is not so much to allow the customer to always have a garment in the correct size, but this technology has the potential to counteract the model that has been established in recent years of ready-to-wear mass-produced clothes in standard sizes.

Fig. 97 – Example of one of the digital dresses developed by The Fabricant. Source: Roberts-Islam, 2019

This technology thanks to the 3D body-scanning technologies are already available to provide body-mapping analysis which, along with a fitting guide, could customize the perfect garment for the customer (Ellen MacArthur Foundation, 2017) An example is Invertex Ltd, a company acquired by Nike in 2018, a leading computer vision firm, specializing in 3D Imaging and AI, to help users find the perfect shoes or to personalize a model by scanning users feet. (Butler-Young,2018). This way it can allow for local production of the garment and at the same time allows for the end customer's desire for customization (McKinsey et Al. 2019). In addition, thanks to the development of avatars, the metaverse has also begun to be discussed in the world of fashion. The metaverse can be defined as a shared virtual or digitally enhanced interactive space (Antin, 2020), or in other words, Metaverse is a parallel reality that acts as a mirror of the real world, where we can work, play, and communicate. In time almost all of us will spend time socializing, learning, working, and entertaining ourselves in the Metaverse. Some may choose to spend almost all their waking time there, seeing the real world as dull, limited, and inefficient by comparison. With increasing amounts of time spent in the Metaverse, the ratio between the virtual and physical possessions we own will increase dramatically (Stephens, 2021). This is precisely the opportunity that many fashion brands, especially in the luxury world, have seen, a market for clothes, which can only be worn digitally, and where the authenticity and uniqueness of the garment are guaranteed by technologies such as Non Fungible Tokens. The soley digital dress could represent a $190B market by 2025, according to CB Insights' Industry Analyst Consensus. In 2019, the digital fashion house The Fabricant garnered headlines for selling a virtual dress for $9,500 through the Ethereum blockchain. The dress could only be "worn" digitally, i.e., edited onto the wearer in post-production (CBInsight, 2021). This allows brand luxury-like properties such as exclusivity and status, which means that luxury brands can extend beyond marketing purposes to commerce-related goals in the metaverse (Mcdowell, 2021)(fig. 97). Moreover, brands started to experiment with digital fashion in the videogames. More and more brands are offering skins, that is the clothes with which you can dress your player, within the videogames. We find for example Ralph Lauren is selling virtual clothes for the first time through Zepeto, a game where you create your unique 3d avatar and you join a virtual world (Zepeto).

More than 20 million avatars are wearing Ralph Lauren products in the game (Mcdowell 2020), while more than 1.2 billion total items have been sold in the game (Kovac, 2021). The experience that brands are developing with the video game world can be leveraged to create true metaverse malls or digital stores. Obviously, for companies, it would be ineffective to simply transport industrial age shopping concepts and conventions to the Metaverse. These malls would be new sales channels and virtual spaces in which shoppers could talk to other shoppers, explore digital fashion items, and enjoy an immersive experience (CBInsight, 2021). One last aspect that we can consider, concerns objects that can be transformed into smart objects, therefore able to collect data and information throughout their life cycle. An example that we can consider are the so-called wearables, which are defined as devices, often electronic, that are worn close to and/or on the surface of the skin, where they detect, analyze, and transmit information (Duking et Al. 2018). They are technology devices that have functions designed to have a positive impact on quality of life, social setting, and environment (H&M Foundation et Al. 2018). We can have products therefore aimed at monitoring the health of the consumer, such as Siren, Socks instead aiming to detect and prevent diabetics' foot injuries. The socks feature microsensors woven into the fabric to continuously monitor temperature, and when they detect a rise in heat that is a possible sign that inflammation is occurring (Siren, 2021). Or Komodotec's AIO Smart Sleeve, which aside from offering accurate heart rate data, monitors sleep, measure stress levels, and even help detect heart inflammation and coronary heart disease as well (Komodotec, 2021). Another category of wearables is those related to sports performance. Wearable X is fitness pants with built-in haptic vibrations that gently pulse at the hips, knees, and ankles to encourage you to move or hold positions (Wearablex, 2021) or we have Hexoskin Smart that is a t-shirt that can pair with your favorite fitness apps such as MapMyRun, RunKeeper, and Strava, and data is captured in real-time and sends it all to the companion app, providing insights on a range of sporty metrics (Hexoskin, 2021). Another genre is the devices to simplify some daily tasks and that often arise from the collaboration of fashion companies with tech giants.

The metaverse can be defined as a shared virtual or digitally enhanced interactive space, or in other words, metaverse is a parallel reality that acts as a mirror of the real world, where we can work, play, and communicate.

An example is a collaboration between Google and Levi's for the birth of Project Jacquard. By building touch and gesture-sensitive areas on the jacket sleeve, users will be able to interact with a variety of services including music and map apps (Google, 2021). Finally, there is one last technology that we want to address, that runs throughout the value chain, is artificial intelligence. Since it is estimated that in 2025 the data that will be available will reach 163 zettabytes, where each zettabyte is a trillion gigabytes, almost tenfold compared to 2016 (Smiths, 2018), companies are investing in analytics and artificial intelligence, which will allow them to extract information from this huge amount of raw data. AI can increase gross value added (a close approximation of GDP) by more than US$ 2.2 trillion in the wholesale and retail industry by 2035, a number corresponding to a 59 % increase compared to the steady-state (H&M Foundation et Al. 2018). These companies are increasingly structuring themselves to be able to better accommodate and manage a huge amount of data they have at their disposal and with the development of artificial intelligence, it’s useful to turn large and diverse data sets into enriched information useful to improve the entire supply chain, from design and manufacturing to sales, marketing, and customer service (McKinsey et Al. 2018).Regarding the design phase, AI can be used to enhance the creative process. Thanks to the use of algorithms to interpret vast amounts of data to predict which product features customers are most likely to prefer. AI’s potential for identifying unmet customer needs and trends (Mckinsey et Al. 2018).

The most famous case is that of Myntra's Moda Rapido brand, which uses AI and generates designs of T-shirts, jeans, and shoes, without the need for human interaction. This system collects data from various sources, such as social media, fashion magazines, and then develops the designs. It now has the highest gross margins compared to all other 14 brands under the Myntra portfolio. (Kalia, 2019). In addition, these solutions also have a major impact in terms of performance because this technology would lead to a reduction in forecasting errors, up to 50%, enabling an inventory reduction of between 20 and 50%. This is the case of the American company Rue La La, which has collaborated with MIT to improve forecasting. They developed a system that helped them predict the demand for products in their flash sales and accounted for data sources including brand information, product type, color, price, and a range of other factors (Bughin et Al. 2017). This enabled them to personal prices and generate a 10 % increase in revenue without the extra burden of unused inventory or supplier costs (McKinsey et Al. 2018). Another interesting example is that of Amazon, which obtained a patent for what it called "anticipatory shipping", meaning that it leverages AI to predict which products will be in fashion for example in a certain neighborhood or city, and then goes to store them near these areas, thus going to reduce transportation costs while improving delivery times (Forbes, 2014). Moreover, as we also introduced in chapter 3, the use of this technology also improves the experience that the customer has with the brand. AI makes it possible to simplify the user experience at the moment of purchase, decreasing the vast choice of products and using the logic of "recommendation" and "next best offer" to recommend only the correct products, decreasing the time in which a customer searching for products. (Fabbri 2018). Ultimately, the enhanced user experience could create long-lasting customer loyalty and drive revenue growth of 10 to 30 % (Boudet et Al. 2017). Not only does the purchase improve, but Artificial Intelligence can also be leveraged to improve subsequent stages, such as customer relationship management. AI can understand the right time to send a message, which are the most appropriate channels and content, to better engage the customer. In the online world, companies including Burberry and Tommy Hilfiger use chatbots, which enable 24/7 engagement with customers. AI can help improve offline engagement as well. Companies can, for example, use it to evaluate sensor-collected data and improve in-store experiences for target customers (McKinsey et Al. 2018).Thanks to increasingly large and diverse data sets, advancement in key algorithms, and unprecedented levels of mathematical computing power, AI can deliver significant speed, cost, and flexibility improvements across the fashion supply chain. Fashion industries need to think about updating the traditional ICT platforms to better exploit all the data that is exchanged in the various stages of the value chain. In particular, need to become advanced platforms, empowered by Artificial Intelligence algorithms. First of all Enterprise Resources Planning (ERP), systems must be able to provide a complete view of the performance of all companies' external resources, from suppliers to retailers up to final customers. Then Product Lifecycle Management (PLM) must be able to keep track of product data and its lifecycle, virtualizing phases such as product development, manufacturing, and marketing, and interface all technologies and applications. Finally, Operational Technologies (OT) must create a virtual copy of all manufacturing operations. In this way, it favors the implementation of a flexible, distributed, and on-demand production system to be implemented, informed by data coming from its networks of resources. (Bertola, 2021).

AI have a major impact in terms of performance because this technology would lead to a reduction in forecasting errors, up to 50%, enabling an inventory reduction of between 20 and 50%. AI makes it possible to simplify the user experience at the moment of purchase, adopting the logic of "recommendation" and "next best offer", driving revenue growth of 10 to 30 %.

5.3. CONCLUSIONS

This chapter was relevant because we looked at how the pandemic impacted the fashion world from the perspective of doing business. The first part begins by showing how during the pandemic period the problem of inventory levels, which have reached the value of € 140 billion to € 160 billion worldwide, has become even more prevalent, and how the increased importance of social media and e-commerce has led to an inverted supply chain. Companies that want to succeed in the post-pandemic era must be prepared for demand uncertainty, and sales volatility, with an increasingly demand-driven and flexible supply chain. To move closer to a demand-driven model, digitizing processes is critical. Virtualization of the design phase is among the areas that offer the greatest benefits. Increasingly realistic 3D software offers opportunities to experiment without having to produce multiple physical prototypes. In addition, retail buyers have the opportunities to directly access the catalog from remote locations, saving time, cost, and wastes. During the pandemic period, brands have tried new methods to connect with the end customer, such as presenting their collections in virtual shows. This solution allows companies to solve some of the growing pain points from a sustainability and investment standpoint. Moreover, an important consequence of virtual shows is the break with the rigid dates of the traditional fashion calendar. The current pause in retail presents an opportunity to reinvent the cadence of the fashion system, realign seasons, and reduce overproduction. The weakness of the global value chain model became even more apparent during the pandemic period. In fact, the first lockdowns in Asia led to the closure of the entire value chain. Fashion companies have understood that they must intervene to modify their sourcing mix to better balance risk, costs, and supply flexibility. For this, it is accelerated the nearshoring. Between the reasons for which it is convenient to resort to this type of solution and the reduction of the gap with China regarding the costs of manpower, regarding countries like Mexico and Turkey. Besides the costs, these solutions guarantee shorter lead times that have high commercial value for on-trend items. As a company gets items into stores faster, it will be able to test and scale more styles. To get all these benefits you need to engage suppliers and develop strong supplier partnerships. In the second part of the chapter, what emerges is that Covid has been an engine that certainly facilitated the transition to Industry 4.0. Industry 4.0 is the representation of a leading enterprise and where there is a combination of “smart factories”, “smart networks” and “smart products”. A smart factory is characterized by a virtual replica of any physical manufacturing operation and can manage the flow of real-time data coming from their customers and their retail. The latter is a very relevant aspect in the world of fashion since it allows to adapt to changing requirements in seasonal fluctuations or change characteristics in the products system. To adapt to this paradigm, businesses will need to figure out how to overcome the problem of making the latest technologies with craft manufacturing. One of the possible solutions is to have "augmented" workers able to mix human unique attributes of creativity and manual dexterity with digital technologies and devices, as the Velasca brand has done. The second aspect relates to smart networks and the need for companies to link the entire value chain from suppliers to retails channels (digital and physical) and follow products until their end-life. Blockchain will prove to be the essential technology to secure this future. The last element is the smart product. The complete digitization of the early stages of development allows to completely replace physical processes with virtual ones, has opened up new business opportunities. One example is the market for phone apps, where it is possible to develop body scanning applications; il metaverse, with the opportunity for many fashion brands, especially for luxury segments, to sell clothes that can only be worn digitally; wearables, that can collect data and information throughout their life cycle and exchange them with the brands. The last part of the second paragraph deals with artificial intelligence, a fundamental technology for managing and extracting information from vast amounts of data. The most innovative companies are structuring themselves to be able to better accommodate and manage a huge amount of data useful to improve the entire supply chain, from designing AI’s potential for identifying unmet customer needs and trends, simplifying the user experience, increasing their loyalty and at the same time deliver significant speed, cost, and flexibility improvements across the fashion supply

chain. This chapter concludes with an extensive analysis of the fashion industry from an industry perspective. The next chapter will deal with the most important resource, not only for the fashion industry but for any business, namely customers. Given the future-oriented perspective of our paper, we will focus on Millennials and Gen Z.

CHAPTER 6

NEXT GENERATIONS

In this conclusive chapter of our research we have focused on people and particularly on the younger generations: Gen Z and Millennials. Indeed, these are the generations that are growing up and will become the next generation of customers and users in the next years. With an initial identikit of the two generations, we find out they detached from older ones for their self-awareness and care, for their refuse to stay on the sidelines and readiness to act and improve the world. A common characteristic critical to explore was surely their confidence with the digital world; GenZers are the first real digital native and thanks to the vast number of smart devices at their disposal, they are considered an always-on generation. Even their own battles, such as climate change, gender equality, ethnic discrimination, have been transferred in a most comfortable environment: social media, which have become the best "organizer" for contents and protests.

Feeling anxious and even ashamed about living lifestyles that are perceived as not environmentally friendly, younger generations are more interested in changing their behaviors to become healthier and more sustainable in their day-to-day lives. Also consumption becomes a matter of ethical concern and consequently this has severe implications for businesses which must rethink how they deliver value and, more than ever, realize what they preach when they address marketing issues and work ethics. They expect companies to take a stand and demonstrate with facts their commitment. They won't take companies on their word alone. They are a hypercognitive generation very comfortable with collecting and cross-referencing many sources of information. The extreme confidence and spread of digital channels offer a wide range of opportunities. Though, with ever-increasing marketing and influencer content on social media, making a representative and significant online social presence stand can become risky. For example, contents need to be available simultaneously on different media, without causing any overlaps or interferences. Trans-media storytelling contributes to raising brand awareness and improving the perception of brand image, but companies need to become hyper-aware of the communication processes active in any social platforms at any moment to preserve brand reputation. To conclude the chapter, we went through some examples of future customers segmentations to understand how the literature foresees the evolution of the customer base in the years to come.

KEY FINDINGS

1- Gen Z alone accounts for 27% of actual global population and are expected to account 34% of workforce by 2030

2- Digital confidence its at his peak with 64% of Gen Z saying they are constantly connected online and spending an average of 4.5 hours per day on social media

3- 88% feel their generation has the power to transform the world for the better, especially on the issues most important to them

4- Among social media users 69% of GenZers and 59% of Millennials say they felt anxious about the future

5- We are living in the era of attention economy, where brands can be out of mind in just 8 seconds

6- 67% of GenZers globally agree there is too much choice online, and a key to address this risk may be the segmentation of one.

6.1. GEN Z AND MILLENNIALS: IDENTIKIT

The generations on which we will focus primarily are Generation Y or also called Millennials, which corresponds to those born from the year 1977 to 1995, and Generation Z or also called Centennials, those who were born from 1996-2012 (Kasasa, 2021). The latter is also known as the first digital native, that is, a generation that has always experienced the world through the filter of the Internet, and the real dimension completely blends with the digital one (Tovazzi, 2020). To give a comprehensive perspective of future generations we should also take into consideration the Alpha Generation, those who were born from 2012 to at least 2025, (Kasasa, 2021) but, because of their extremely young age, there are no in-depth studies on this generation yet. On the contrary, Gen Z and Millennials are of main interest because of their actual and future spending power. Together they represent about $ 350 billion in spending power in the U.S. alone (around $150 and $200 billion spent by Gen Z and Millennials respectively), and Gen Z alone will account for 40% of global consumers by 2020 (McKinsey et Al., 2019). As a matter of fact, Gen Z represents alone 32% of the world population and, along with Millennials, 54% of the global population (Fig. 98).

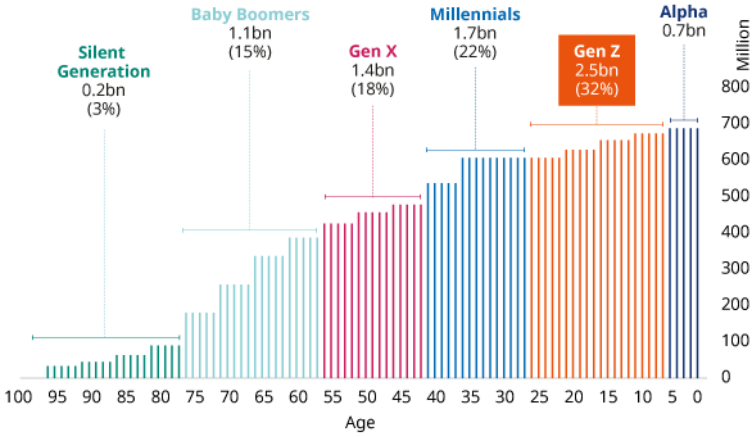


Fig. 98 - Global population breakdown for demographic segmentation.
Source: UN Euromonitor, retrieved by Schroders 2021.

These figures are even more relevant if we consider that Millennials, who have now surpassed Baby Boomers as the largest segment of the population, are on the cusp of their peak spending years, and will increase their per capita spending by more than 10% over the next five years. Gen Z consumers will increase their per capita spending by more than 70% over the same period and will set to around $ 33 trillion in 2030; on the contrary, both Gen X and Baby Boomers will decrease their spending in the coming decade (Bona et Al., 2020; Schroders, 2021). It is quite difficult to describe in detail the differences between Gen Z and Millennials, since the two generations are quite overlapping, meaning that especially the youngest Millennials share most features with GenZers.

Gen Z and millennials are the next generation of users and detached from older ones for their self-awareness and care, for their refuse to stay on the sidelines and readiness to act and improve the world.

For this reason, with this initial identikit, we would like to spot the remarkable characteristics that make these two generations unique, which mark the change with the older generations. What can be surely stated is that these generations look for a healthy and conscious lifestyle (Snap Inc. et Al., 2019). Self-awareness, self-care, wellness are keys in the youngest lives: for some, this means trying activities like meditation (36% of Gen Zers in the UK, 38% in the US); for others, it means simply indulging in a little vice, such as chocolate or candles (51% in both the UK and the US). Gen Z participates in a wide range of activities to make use of their free time, from cerebral to craft, physical to playful (Facebook, 2020); it looks like there is an urgent pressure to fill in life with activities and meanings. Resentment is also another keyword to describe particularly the Gen Z, a generation that does not stay on the sidelines but is ready to act and improve the world, often starting with their own physical and mental well-being.

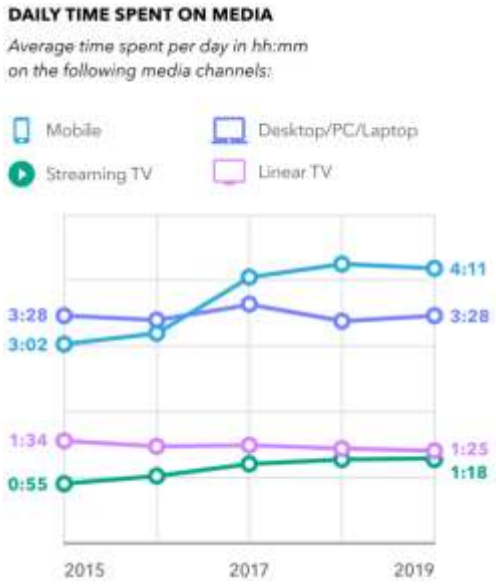


Fig. 100 - Average time spent per day by Gen Z on different media channels: Mobile, Desktop/PC/Laptop, Streaming TV, and Linear TV. Source: Snap Inc. et Al., 2019.

As previously mentioned, GenZers are the first real digital native and thanks to the vast number of smart devices at their disposal, they are considered an *always-on* generation: 64% say they are constantly connected online, and particularly smartphone that is the most used device if compared with Laptop or Desktop PC (Fig. 99), up to the point that 57% feel more insecure without their cell phone than their wallet. 97% of them own a smartphone, and at the end of 2018, they were spending an average of 4 hours and 15 minutes per day on their phones (fig. 100) (Snap Inc. et Al., 2019).

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Millennials are also big smartphone users; according to a survey conducted by PwC, Millennials and GenZers shop daily or weekly using their smartphones, frequency higher than their older counterparts, a trend we think is set to continue (PwC, 2021). Of course, social media are the most attractive feature that the digital world offer. As a matter of fact, Gen Z uses social media much more than past generations (European Union, 2020), not only to entertain themselves but also to inform and participate in issues that matter to them; fig. 101 shows for example the top motivations for sharing on social media social and environmental contents, ranging from just looking like a good person to motivate other people to care as well. Generation Z has seen the extreme effectiveness of social media in creating grassroots movements at lightning speed; for proof of this, consider the online impact of #MarchforOurLives or #MeToo (Porter Novelli et Al., 2019).

Fig. 99 - Importance of smart devices in the eyes of Gen Z: Mobile, Laptop, and Desktop PC. Source: Snap Inc. et Al., 2019.

This continued connection to the digital world, however, should not be mistaken as a sign of detachment by the reality; it should rather be interpreted as a sign of the desire to engage immediately with their wide networks, and have the chance to interact with like-minded creators and communities which can entertain, educate, and inspire. The need to create and feel part of a community is another characteristic of paramount importance for Gen Z, who often turn to online spaces to expand their network.

These online spaces allow exploring passions in a motivating environment, offering comfort, acceptance without judgment, and the need for explaining oneself (Facebook, 2020). In this digitalizing world, privacy is becoming more and more a very important issue, as emphasized by the various European regulations such as the General Data Protection Regulation of 2016. New generations are particularly sensitive, with 60% saying they are concerned about how their personal data is being used by companies and 53% saying they prefer to be anonymous when online (Snap Inc. et Al., 2019).

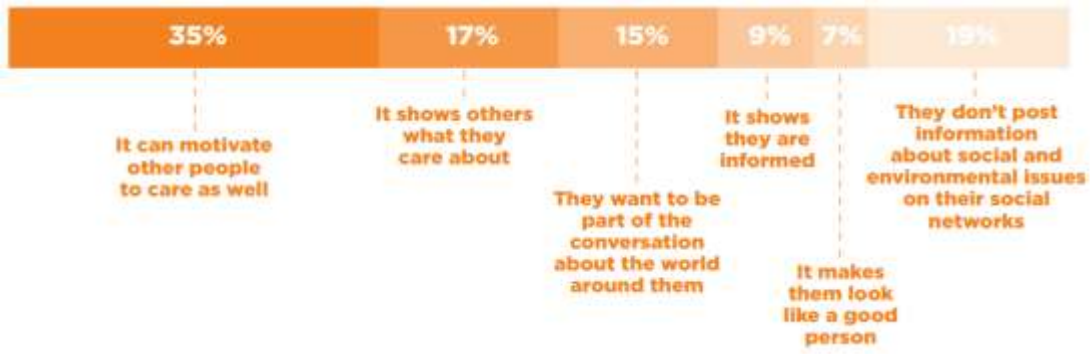


Fig. 101 - Top motivations for sharing Social and Environmental content on social media.
Source: Porter Novelli et Al., 2019.

6.2. THEIR OWN BATTLES

Previously we have quickly mentioned that the kind of inner research for wellbeing and balance is very common among the youngest, and it is often only the starting point; GenZers particularly do not sit on the sidelines, but 88% feel their generation has the power to transform the world for the better, especially on the issues most important to them (Porter Novelli et Al., 2019). They stand out for the high level of engagement regarding some battles and the success in sharing and participation is linked to the transformation that activism is undergoing thanks to this generation. They have taken activism in a most comfortable environment: online (YPulse, 2020). Social media have evolved too, from a traditionally recreational and superficial tool into the best "organizer" for contents and protests. Social media have become a tool to summon protesters on the ground and coordinate movements in real-time. Rallies, vigils, marches, and protests are planned the night before by different organizations all fighting for the same goals and coordinating both on and off social platforms.

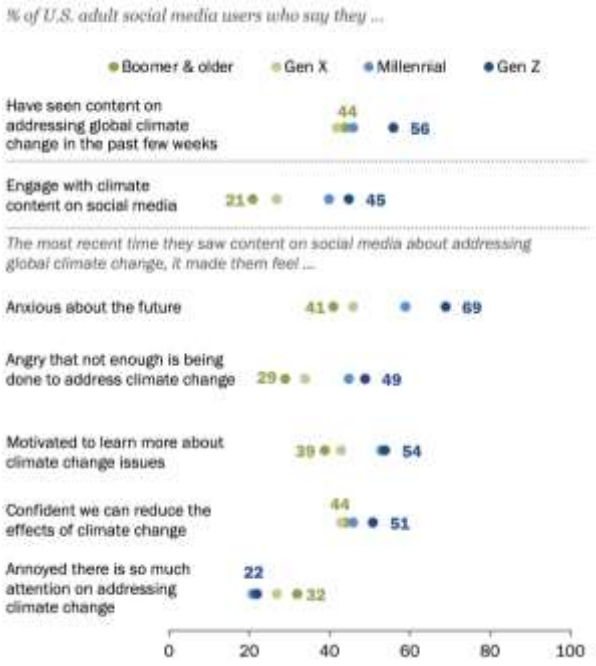


Fig. 102 – Engagement with climate change contents, the breakdown for Generations of Users. Source: Thigpen et Al., 2021.

Today's civil rights movements do not require anymore a centralized leadership structures to make waves. Fights against racism and police brutality, for example, are structured around a community-centered leadership model (Bellan, 2020). Many of the movements that have sparked in the last years, wouldn't have been able to bring in thousands of protestors if it wasn't for the online channels, which quickly spread the word online via social media especially. Instagram, for example, has been taken over by political content (YPulse, 2020). Sustainability is surely a topic of high interest for both Gen Z and Millennials, since it has emerged already some years ago, but it is Gen Z who is pushing it even further and accelerating also other trends (Rahilly et Al., 2020). Often at the forefront of the climate debate, we find younger activists: it's the case of voices such as Greta Thunberg or the Sunrise Movement, a youth-led political organization demanding increased heed to climate changes (Rapid Transition Alliance, 2021). GenZers and Millennials are talking more about the need for action on climate change and they are also doing more to get involved, through activities such as volunteering, joining movements and organizations, attending rallies and protests (Ray, 2020). Also, in this case, social media play a primary role, being the primary space for debate on climate change. Research conducted by Pew Research Center, despite being focused only on U.S. social media users, still shows us relevant data on young people's behaviors. 45% of Gen Z adults and 40% of Millennials have interacted with content on the need for actions to fight climate change, following an account, liking, or commenting on a post, posting, or sharing content themselves. By contrast, much smaller shares of Gen X (27%), Baby Boomer, and older users (21%) have engaged with content about climate change in any of the aforementioned ways (Fig. 102).

GenZers feel their generation has the power to transform the world for the better. They have taken activism in a most comfortable environment: social media have evolved into the best "organizer" for contents and protests.

Pretty concerning is the sentiment that arouses in GenZers as they engage with climate change content online, which is namely anxiety about the future. Among social media users, nearly seven in ten GenZers (69%) say they felt anxious about the future. A smaller majority (59%) of Millennial social media users report feeling the same way the last time they saw climate change content, whereas fewer than half of Gen X (46%) and Baby Boomer and older (41%) state the same. Anxiety about the future is also a dominant emotional reaction to climate change content specifically among those who are most engaged with the issue on social platforms, those who follow a climate-focused account, interact with, post, or share climate content themselves (Thigpen et Al., 2021). Anxiety is also often accompanied by a sense of shame about living lifestyles that are perceived as not healthy and environmentally friendly. Therefore, it is not surprising that younger generations are more interested in changing their behaviors to become healthier and more sustainable in their day-to-day lives. GenZers are the most likely to desire to change their lifestyles. Also in this case, Millennials follow Gen Z leading, and surmount older generations. A similar pattern persists when looking at actions that have already been taken in 2020, with Gen Z consumers claiming to have made some or major changes to become more environmentally friendly (74%), healthy (80%), and more helpful to others (77%) (Fig. 103, Fig. 104).

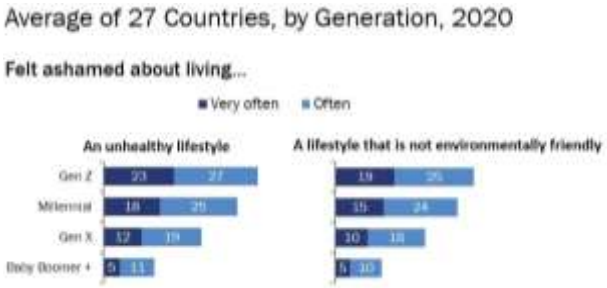


Fig. 103 – Percentage of respondents feeling ashamed about living unhealthy and not environmentally friendly lifestyles, by generations. Source: Hassim, 2021

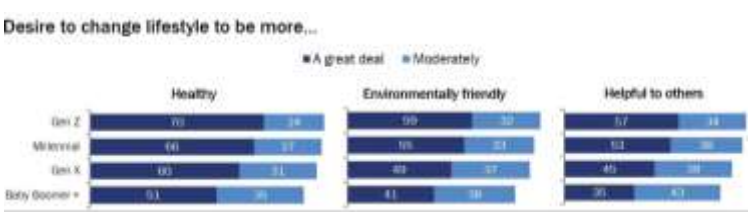


Fig. 104 – Percentage of respondents desiring to change lifestyle in the future, the breakdown for generations. Source: Hassim, 2021.

Anxiety is accompanied by a sense of shame about living lifestyles that are perceived as not environmentally friendly. Younger generations are more interested in changing their behaviors to become healthier and more sustainable in their day-to-day lives.

Climate change and general environmental issues are not the only topics these younger generations are not concerned about. Being Gen Z more ethnically diverse (fig. 105) makes them a radically inclusive and equality-based generation (Francis et Al., 2018). As a result, we find the ethnic theme as core in the battles of the youngest generations: #blacklivesmatter is probably the most known example, and once again social media have been pivotal in the evolution of the movement. Black Lives Matter began as a simple hashtag in 2013, following the acquittal of George Zimmerman in the killing of Trayvon Martin, and grew into a movement the following year after the deaths of Michael Brown and Eric Garner. In 2014, #BlackLivesMatter peaked already at 146,000 tweets, and on 28/05/2020. Twitter told The New York Times that the hashtag has been published in more than 8 million tweets (Bellan, 2020). Gender identity and expression are also a major battle for the younger generations. Gender identity is “one’s innermost concept of self as male, female, a blend of both or neither, … and what they call themselves. One's gender identity can be the same or different from their sex assigned at birth”. Gender expression is the “external appearance of one's gender identity, … which may or may not conform to socially defined behaviors and characteristics typically associated with being either masculine or feminine”. The core of the fight lays in the freedom of self-identification; “Genderqueer people for example typically reject notions of static categories of gender and embrace a fluidity of gender identity and often, though not always, sexual orientation.

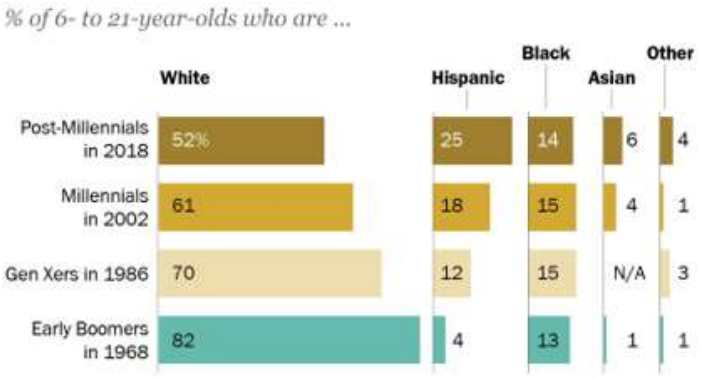


Fig. 105 – U.S. population ethnographic composition, breakdown by generations. Source: Parker et Al., 2020.

People who identify as "genderqueer" may see themselves as being both male and female, neither male nor female nor as falling completely outside these categories" (Human Rights Campaign, 2021). Roughly half of GenZers (50%) and Millennials (47%) think that society is not accepting enough of these people. Percentages considerably drop if we consider Gen X (39%), Boomers (36%), and Silent Generation (32%). Across all generations, roughly a quarter say society's acceptance level is about right (Graf et Al., 2019). But not only that, they are very concerned with human rights, feminism (Francis et Al., 2018), poverty, hunger, economic development, education (fig. 106): in short, Gen Z is a true activist generation (Porter Novelli et Al. 2019). Taking inspirations from the historical social movements that fought for feminism, anti-racism, anti-classism, and more, the youngest generation embrace intersectionality.

Gen Z is a true activist generation embracing intersectionality as a way of understanding and explaining complexity in the world, in people, inhuman experiences. Today's activism does not address discrete issues, rather builds on a variety of themes, trying to change social contexts and free people's lives from inequalities.

"Intersectionality investigates how intersecting power relations influence social relations across diverse societies as well as individual experiences in everyday life. As an analytic tool, intersectionality views categories of race, class, gender, sexuality, class, nation, ability, ethnicity, and age – among others - as interrelated and mutually shaping one another. Intersectionality is a way of understanding and explaining complexity in the world, in people, inhuman experiences" (Collins et Al., 2020). Today's activism does not address discrete issues, rather builds on a variety of themes, trying to change social contexts and free people's lives from inequalities.

Fig. 106 – Comparison 2017 – 2019 of top priority issues GenZers expect companies to address. Source: Porter Novelli et Al., 2019.

6.3. BUSINESS IMPLICATIONS

Being so active and feeling so responsible for not only oneself but also for the entire world, Generation Z and the Millennials have high expectations from the businesses and accept or refuse companies based on multilevel analysis. Their awareness of the numerous issues that plague our society, expect and frankly require the companies to shift the paradigm. They expect companies to take a stand and demonstrate with facts their commitment: more than nine in ten believe that if a company commits, it should have the appropriate programs and policies in place to back up that commitment. They won't take companies on their word alone. They are a hypercognitive generation very comfortable with collecting and cross-referencing many sources of information. Three-quarters (75%) will research to see if a company is walking the talk when it takes a stand on an issue. This ease of access to information and in a very fast way, allows them to assess companies with confidence and choose only the ones that show a real value-led, purpose-driven approach to business (Porter Novelli et Al., 2019).

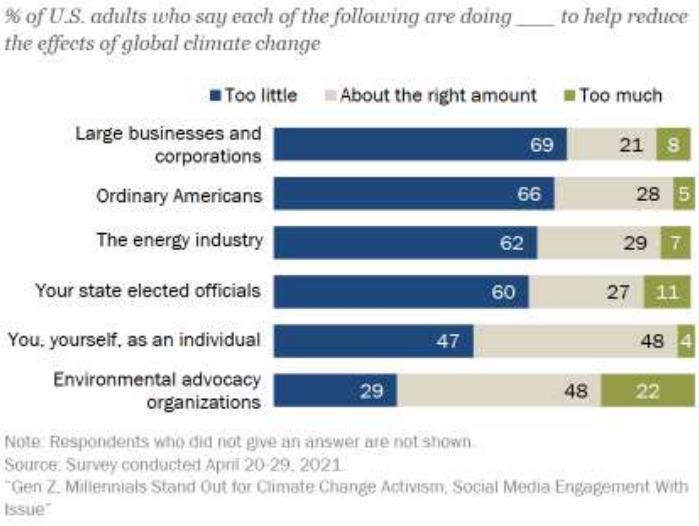


Fig. 107 – U.S. Gen Z and Millennials respondents' opinion about whether some typologies of companies are helping reduce the global climate change.
Source: Tyson et Al., 2021.

Once a brand is chosen, still does not mean it is going to remain with the preferences. They get to know very well the brands and so expect transparency over time, especially since they are very much able to identify contradictions. Therefore, this *"searching for the truth"* is at the very heart of the youngest's identity (European Union, 2020) and companies need to be continually careful about the statements they make and the issues they choose to promote, as these generations are willing to switch brands very easily: 48% of the Gen Z states they have switched brands based on these considerations, compared to just 28% of Baby Boomers (Global Fashion Agenda et Al., 2019). Of course, the topics of main interest for these generations are those introduced in the previous paragraph *Their Own Battles*, starting from the environmental issue. Nine-in-ten Generation Z consumers believe companies have a responsibility to address environmental and social issues, and that right now public and private actors are not doing enough to help reduce climate impacts (McKinsey et Al., 2019). More than six-in-ten Americans say large businesses and corporations (69%) and the energy industry (62%) are doing too little to address climate change (Tyson et Al., 2021) (fig. 107). The next generation is looking for brands to make a real change with: 85% want to share ideas and experiences with brands to help develop better solutions, and they will reward those brands that take serious responsibility in creating the change they seek. Moreover, 93% of corporate employees under 30 agree that the more socially and environmentally responsible their companies become, the more motivated and loyal they will be as employees (Hassim, 2021).

GenZ and Millennials expect companies to take a stand and demonstrate with facts their commitment. They won't take companies on their word alone. They are a hypercognitive generation very comfortable with collecting and cross-referencing many sources of information.

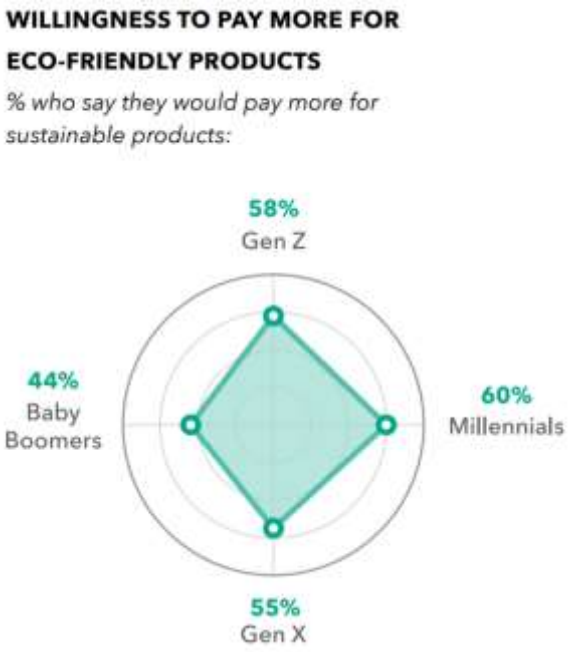


Fig. 108 – Willingness to pay a green premium, the breakdown for generations. Source: Snap Inc. et Al., 2019.

This next-generation has opportunities for businesses, on one hand as customers, since they are willing to pay extra for sustainable products (Snap Inc. et Al., 2019) (fig. 108) and 69% of them is more likely to make purchasing decisions from companies that contribute to social causes (Facebook, 2020), a sign that it is important to them that the purchase reflects personal values and beliefs. On the other hand as the next generation of employees also, showing business ethics aligned with the worker's expectations will be essential but will also bring benefits in terms of motivation and active engagement. With this in mind, brands should be focusing less on promotional messaging and more on purposeful content, for example: how they're doing their bit for the planet (WP engine, 2018). Until now we have understood the importance that the individual dimension plays for GenZers and their reactance to labels. This has sure implications for the business since also consuming goods or enjoying services are perceived as a way to express the individual identity. Consumption becomes a matter of ethical concern, particularly taking into account the high impact of some categories of products that are consumed on a global scale. Businesses must rethink how they deliver value, rebalance scale, and mass production to achieve personalization, and, more than ever, realize what they preach when they address marketing issues and work ethics (Francis, 2018).

Consumption becomes a matter of ethical concern. Businesses must rethink how they deliver value, rebalance scale, and mass production to achieve personalization, and, more than ever, realize what they preach when they address marketing issues and work ethics.

Another of their battle introduced earlier is the gender issue, and it perfectly applies to understanding the urge for business adaptation. Gender is perceived as a construct, and consequently, Generation Z and young millennials are calling for retailers to adjust how they design and produce products for men and women and challenge time-tested gender ideals. Companies that have already learned to represent gender fluidity in their advertising, packaging, and products offered are effectively showing the next generation of consumers that their brand understands who these young customers are and how they self-identify (Glasheen, 2019). GenZers embrace their individuality and cope with human complexity; quite the opposite, they do see their diversity as an asset that needs to be reflected in the business environment, from advertisement to production. 71% of GenZers surveyed globally would like indeed to see more diversity in advertising (Facebook, 2020), and the fashion world is among the first industries to see the potential in these new market-driven demands. Luxury designers like Gucci, Saint Laurent, and Haider Ackerman have held coed runway shows. Moda Operandi debuted its first unisex streetwear collection in 2018, and Zara started releasing ungendered collections in 2016 with models of both sexes styled in the same clothes (Alnuweiri, 2018).To survive in the long run, businesses will inevitably need to meet younger generations' needs and adopt a purpose-driven approach. This means showing strong commitment through tangible actions from both the environmental and social point of view, reducing the human footprint on our planet, erasing inequalities within our society, understanding the new dimensions of humanity that we are going to face in the next future.

6.4. DIGITAL PROMISES AND RISKS

Not only are the next generations grounded in the reality and aware of our world issues, but also the digital sphere is taking more and more important in everyday life. For this reason, businesses need to adopt new forms of interaction and selling to be attractive. We could define these generations as hyper-cognitive and very comfortable with collecting and cross-referencing many sources of information; their customer journey is the integration of virtual and offline experiences (fig. 109). The spread of mobile devices enables continuous connection, also with brands that can and must meet them in the digital world. Engagement is well-suited for digital channels thanks to a capillary reach, but still, 81% of Gen Z consumers prefer to shop in stores (Wu, 2019). According to Andreetta, "unlike Millennials, Gen z likes to convert in the physical store. Closing occurs most often inside a real space, where a multi-sensory experience is possible" (Tovazzi, 2020 p. 34). Brands are starting to create a retail experience that blends digital with physical aspects, adopting a model called *click-and-mortar*.

This kind of selling strategy offers increased flexible options and a better customer experience overall and meets the demand for an integrated online and offline shopping experience. Typically, the experience starts online, where Gen Z and Millennials shoppers can compare prices, search for discounts, and research alternative products and sales channels, and then conclude the purchase physically. When young shoppers search for products and services on smartphones, they will receive local results. Indeed, brands at the top of the results page are doing a better job at optimizing for local SEO, since they need a strong local presence to be a more likely part of Gen Z buying choices: 76% of people who search on smartphones visit a business within a day (Chatmeter, 2020). Social media are fundamental to strengthen the virtual connections with these young tech virtuosos, whose consumption choices are strongly influenced by content on social media. 29% of GenZers states they are influenced by sponsored ads and 25% by influencers' ads, while for millennials the percentages are 22% and 24% respectively. For older generations, social media represent a tool namely for staying in touch with friends (38%), rather than being a purchasing tool. For GenZers instead, social media are also key for their purchasing goods choices especially for fashion (56%), technology (42%), and travel (31%). While traditional TV advertising is still the most effective means of communication for all generations, the liking of the younger generation is lower (29% Gen Z, 33% for Gen Y), if compared to older ones, who amount to 41%.

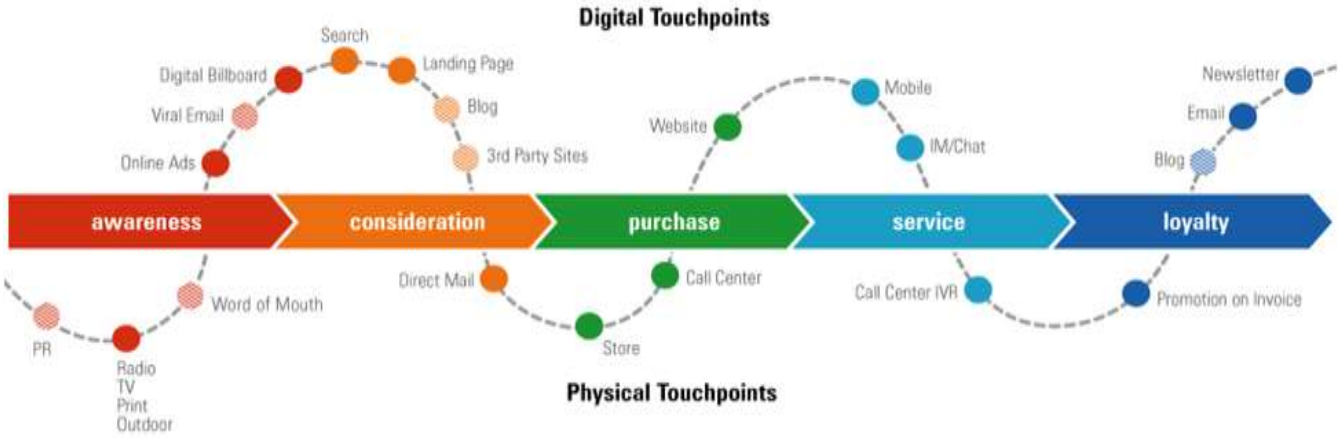


Fig. 109 – Integration of Virtual and Offline experience in the customer journey. Source: C-Direct, 2020.

Older generations continue to prefer traditional forms of communication such as magazines or newspaper printed advertisement (30%), personalized ads via emails (27%), and personalized flyers received through their letterbox (27%) (PwC, 2020) (fig. 110). On the contrary, Gen Z is a segment that heavily relies on peer recommendations, and therefore incorporating a marketing strategy leveraging on influencers can prove to be beneficial in driving sales and in extending the brand's reach. Yet, with ever-increasing marketing and influencer content on social media, making a representative and significant online social presence stand can become challenging. The first difficulty is to find the right influencers, who are representative of the brand's style and main values, rather than those with the highest follower counts (Chatmeter, 2020). An interesting result highlighted by research conducted by Facebook in 2020, shows that in the UK young people are more introverts than extroverts. This may explain why 76% of them use Instagram to view other people's Stories, while only 35% use it to create them. With Gen Z taking on the more passive role of "listener", brands need to adopt the role of "creator" and consider using Stories, or newly introduced Reels, to outstand and attract users (Facebook, 2020).

With ever-increasing marketing and influencer content on social media, making a representative and significant online social presence stand can become challenging considering that brands can be out of mind in just 8 seconds.

For instance, many brands are exploiting Instagram Shopping to create an immersive shopfront directly on people's Feed and Stories, enabling them to discover, explore and fall in love with products there and then. This easiness of both access and provision, a unique feature of social media, also leads to risks that are crucial to be considered. We are entering more and more in a world ruled by the attention economy, where brands can be out of mind in just 8 seconds. Gen Z consumers particularly want the hard work taken care of, they want the right product, and an easy process to identify it. Hence, we are witnessing more and more purchasing decisions that are being influenced by family and friends.

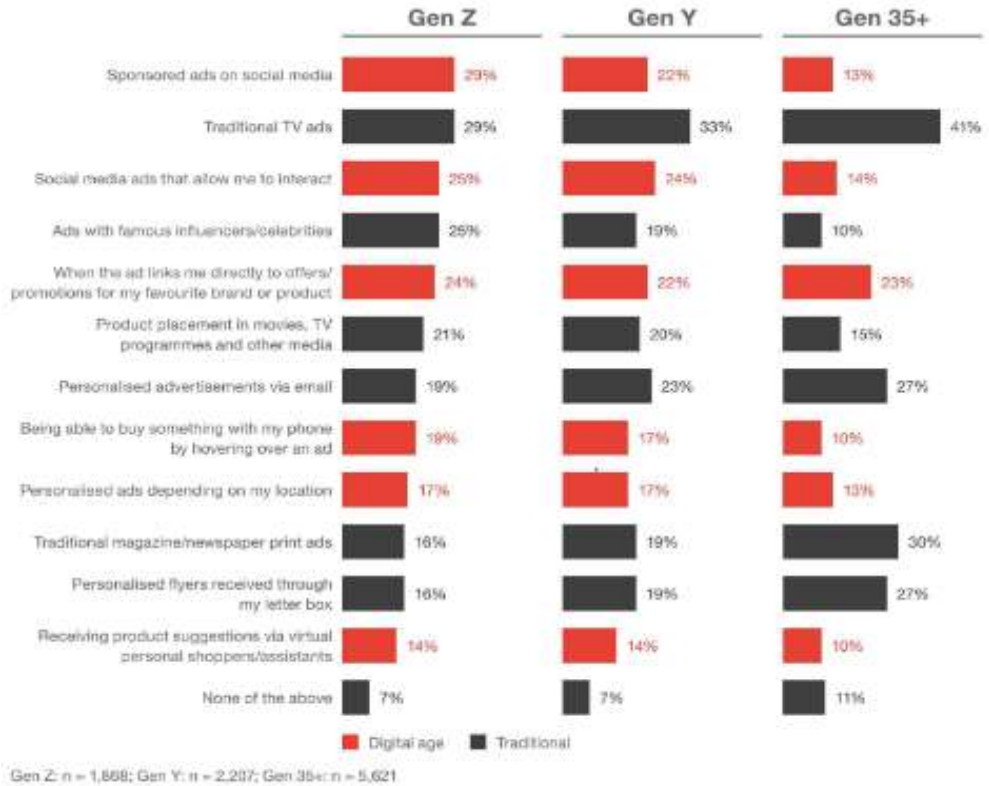


Fig. 110 – Types of media preferred by different generations. Source: PwC, 2020.

Accessing their personal network for giving product recommendations means cutting out the consideration phase and moving directly into action, conveying safety in the knowledge that they have been guided by a trustworthy and dependable voice (Facebook, 2020). However, this rapidity of purchasing choices should not be misunderstood with impulsive buying. On the contrary, they are thrifty, choose products very carefully; as Erika Andreetta says "their closet is not large and they are not driven by the logic of accumulation. They prefer to buy few products but with a clear DNA" (Tovazzi, 2020). For this reason, these generations, daughters of the sharing economy and champions of the circular economy, are open to forms of collaborative consumption, with 14% who have already used fashion renting services and a further 23% who will be interested in using it in the future. (PwC, 2021). Another major risk of the digital channels is the over-provision of alternatives. Also considering the rise in fast fashion, an increasing number of retail brands are today available and offer too many options to the point that it becomes difficult to inspire youth loyalty: 67% of GenZers globally agree there is too much choice online. The key to addressing this may be the personalization of products. By connecting through personalization and by surfacing authentic brand values, marketers can effectively draw in GenZers and build enduring loyalty (Facebook, 2020). We are entering the "segmentation of one" era now that companies can use advanced analytics to improve their insights from consumer data. Moreover, to improve customer trust, it is not only necessary to have quality products, but above all an effective customer service, able to simplify the shopping experience and help them in case of problems. Retailers must make their returns-process and customer experience hassle-free: 70% of consumers said they have used social media for customer service at least once (Ahmed, 2017). Automated chat-bots often appear impersonal and unable to resolve their issues, whereas live-chat services with Advisers, or even better, omnichannel customer service, allow personal and effective responses (Denby, 2018). By focusing on local SEO and review management, brands can potentially tap into Gen Z's vast buying power and create brand-loyal consumers. Reviews are indeed Gen Z's word-of-mouth, which makes reputation management one of the top priorities for brands.

All brands should respond to reviews efficiently to make customers feel listened to and identify potential problems. Before purchasing a product or service for the first time, 86% of Gen Z read reviews (Baer, 2018), even if a trusted source were to recommend a certain product, reviews remain a deciding factor to seal Gen Z's decision in the end (Chatmeter, 2020). As much as they prize their individuality, GenZers also want to feel understood and belong to communities. In recent years, an additional touchpoint has been added to the journey of these generations: smart speakers. The number of smart speakers in U.S. households will grow 135% by 2022, highlighting the fact that we are now in a voice-first world. As digital natives, Gen Z leverages voice search throughout their buyer journey process and voice technology provides the instantaneous results that Gen Z shoppers are looking for, especially when they're multitasking on the go. Preparing for a voice-first world with a Voice Engine Optimization (VEO) strategy is crucial for all brands. When shoppers use voice search, they only receive one to three search results, depending on the device. From this point of view, smart speakers help reduce the over-provision of alternatives, but it also means that the competition for brands to be featured as a search result is only getting tougher. When consumers use voice search, they are asking conversational questions often without mentioning a brand name. If retailers can focus on answering questions and optimizing for long-tail keywords, they'll be more likely to rank for voice searches (Chatmeter, 2020).

By connecting through personalization and by surfacing authentic brand values, marketers can effectively draw in GenZers and build enduring loyalty. We are entering the "segmentation of one" era, now that companies can use advanced analytics to improve their insights from consumer data.

The last complexity to face when developing an appealing customer journey is the variety of media available that urges brands to design trans-media storytelling. It departs from the "traditional" models of communication, where the same story is shared without changes throughout the different media (Gobbi, 2018). In transmedia storytelling, contents are available on different technological platforms, without causing any overlaps or interferences. This allows to target different audiences by refining and supplementing the user experience with new and distinct information. It means to allow the multiple media to tell different stories from multiple narrative perspectives, but all exploring a common theme (Rinaldi, 2019). Trans-media storytelling contributes to raising brand awareness and improving the perception of brand image to name but a few beneficial effects, but companies need to become hyper-aware of the communication processes active in any social platforms at any moment to preserve brand reputation (Osipova, 2015). The evolution of data science and the increasing adoption of integrated and complete information management systems will help the development of transmedia storytelling. These solutions enable us to consider the omnichannel system in which the clients move and support the generation of new profiling criteria. Still, the implementation of an appropriate trans-media storytelling strategy is complicated, time-consuming, and costly, but will become necessary to guarantee the engagement of the next generation of consumers (Rinaldi, 2019).

In transmedia storytelling, contents are available on different technological platforms, without causing any overlaps or interferences. Trans-media storytelling contributes to raising brand awareness and improving the perception of brand image, but companies need to become hyper-aware of the communication processes active in any social platforms at any moment to preserve brand reputation.

6.5. FUTURE CUSTOMERS SEGMENTATION

"We are wrong to use age definitions and put everyone into one age bracket. People have different contexts, motivations and there are different sub-groups within that demographic". This is Jonathan Reynolds' opinion, a retail and e-commerce expert at the University of Oxford, regarding the habit of segmenting people based on age and generation. For this reason, we would like in this last paragraph to explore the most interesting classifications proposed by business and sociologic literature and get the main insights about what the future customers will be. Given the scope of our research work and the importance of sustainability in Gen Z and Millennials' mind, we are mainly focusing on classifications regarding sustainability and fashion.

The first market segmentation to consider was made in 2002 by Natural Marketing Institute (NMI) and is built on the interest towards sustainability. This model identifies five categories of people:

UNCONCERNEDS®	*CONVENTIONALS®*	*DRIFTERS®*
Less concerned about the environment and society.	Practical and rational; driven by cost savings; eco-benefits are secondary.	Green followers: newer to the green marketplace but want to be seen as doing their part. In search of easy green changes.
NATURALITES®	*LOHAS®*	
Personal Health drivers greater than planetary health; strong secondary target for natural/green consumer packaged goods brands.	Personal and planetary health priority; sustainability is entrenched in lifestyle; heaviest purchasers of "green"; early adopters & influencers.	

Tab. 2 Natural Marketing Institute market segmentation based on sustainability interest.
Source: Fashion Industry 2030, Rinaldi, F. R. (2019).

The *LOHAS®*, acronym for *Lifestyle of Health and Sustainability*, is the category mostly analyzed by this model since entails people with the highest care for sustainability; this is strongly reflected into all their consumption choices and even become an issue to spread among personal and social communities, making *LOHAS®* valuable influencers. Some years later, an interesting study was published by Ernst & Young, forecasting the possible development of the *LOHAS®* category, identifying three main scenarios. In the first, the *LOHAS®* segment remains a niche market, meaning that the interest in sustainability fluctuates rather than steadily grow. In the second scenario, it becomes instead mainstream: sustainable products report continuous growth and people are more and more willing to find alternatives more sustainable. Eventually, the third and more likely scenario foresees a relevant boom, with *LOHAS®* becoming the dominant lifestyle and accepting higher prices for goods and services (Ernst & Young, 2008). All these considerations open wide opportunities for various industries to develop sustainable products and business models, and particularly for fashion, which we have already seen in Chapter 4, being among the worst-performing industry from a sustainability point of view. But if on one hand, it is uncontroversial that consumers are progressing towards more attention to sustainability, it is also necessary to understand that not all people share the same interest level. An exploratory study published by SDA Bocconi School of Management journal has clustered consumers based on the level of involvement in sustainable practices. *Fashion-driven* are the consumers for whom aesthetic is central along with quality and price, without being interested in sustainability. *Balanced* are those who seek a balance between aesthetic and responsibility, but the former still outweighs the latter; indeed, the *balanced* own few products that can be characterized as responsible. The third category is the *Radicals*, for whom responsibility prevails over everything else; they show indeed low-price sensitivity and a strong sense of responsibility towards others and make purchasing choices in favor of sustainable products. Finally, the *Value-driven* are those consumers that prioritize quality, price, and durability; responsibility and particular attention for the environment result as being more important than aesthetic, and consequently, they buy sustainable products, but still in a lower quantity if compared with the rest of their wardrobe.

What we found interesting about this study is that aesthetics remains a fundamental selection criterion for the majority of consumers; nonetheless, they are more and more willing to experiment with responsibility purchasing, even with different levels of predisposition. The most interesting segment is the *Balanced* one, where this tension between aesthetic and responsibility finds its highest balance. Brands can therefore build tailored offers for this segment, by launching stylish products which, at the same time, respect the high attention towards environment and society requested by this market segment (Rinaldi et Al., 2015).

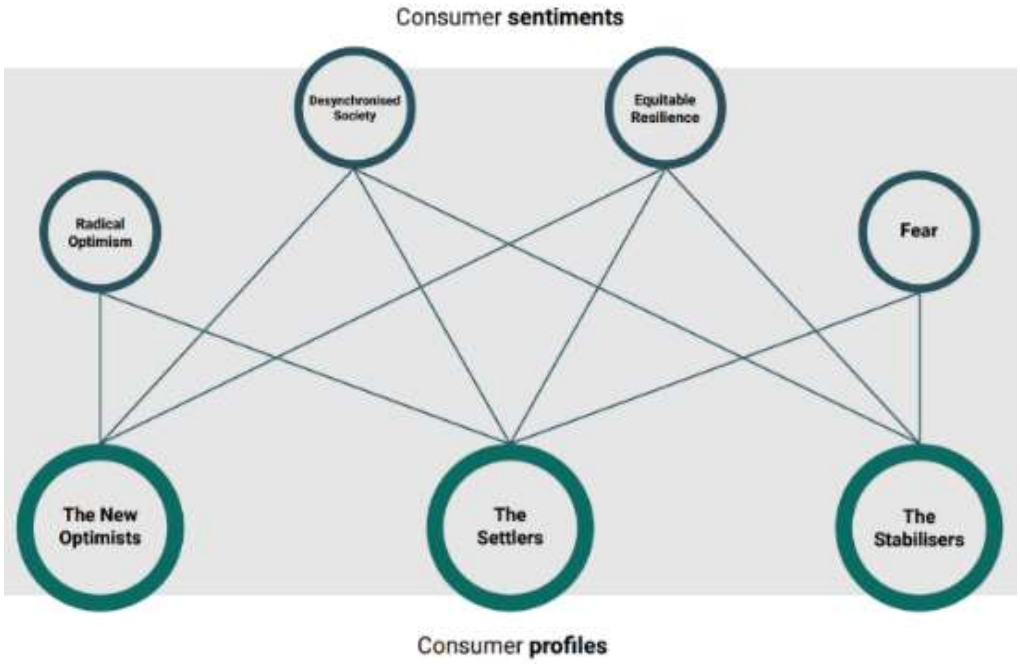
AIO		Fashion-Driver	Balanced	Radicals	Value-Driven
Activities		Reading Social life Cooking	Travel Sport Culture Meeting friends	Volunteering Culture Reading Meeting friends	Reading Culture Meeting friends
Interests		Cooking; Travel	Travel	Travel	Cooking Travel
Opinions	Religion	Poor practice	Strong spirituality	Weak Interest, rational approach	Strong Spirituality
	Medicine	Scepticism towards traditional medicine	Alternative medicine	Weak use of alternative medicine	Alternative medicine
	Family	Integration of work, family and friends for self-realization	Need for balance	Work as a form of self-realization	Need for balance

Tab. 3 - Main characteristics of consumers interested in sustainability.
Source: Rinaldi et Al. (2015)

Another segmentation that has been proposed, again with a focus on sustainable issues, is the one proposed in the Pulse of Fashion 2019 report by Global Fashion Agenda, Boston Consulting Group, and Sustainable Apparel Coalition. According to this research, sustainability considerations are not yet powerful enough to be the most important purchasing criterion.

Only for 7% of consumers, sustainability is the key purchasing criterion, but still, 23% prioritize high quality, 17% feel successful, and 16% receive good value for money. Hence, sustainability considerations are seen more as a prerequisite rather than a driver of purchasing decisions. According to this study, three consumer segments and six nested subgroups emerge. The first is the *Resistant*, who count for 35% of the sample and are those who are not interested in sustainability issues in fashion. They might even feel deterred from purchasing products marketed as more responsible, because they expect them to be more expensive, being price their first purchasing criterion. The typical member of this segment is a Baby Boomer, with low to medium income, usually with high school education, who are either retired, a homemaker, or unemployed. Next, the second segment, and the largest one numbering up to 49% of the sample analyzed, is called the *Middle ground*. These consumers express a mild interest in sustainability in fashion and other product categories and they see sustainability as something to be valued. In terms of purchasing practices, they view a company's attitude about responsible practices as being important, but the key purchasing drivers are still aesthetic and price. The middle ground can be broken down into two subgroups: low involvement (42%) and supporters (7%). While the latter supports sustainability in fashion and other categories but does not consider it as the primary purchasing driver, the former pays only general attention to the topic without concretely supporting it. The last category is the *Open*, counting for 16% of the sample.

Tab. 4 – Three segments and six subgroups proposed in Pulse of Fashion.
Source: Global Fashion Agenda et Al. (2019)



Tab. 5 – How different sentiments interact to create the different profiles. Source: WGSN (2020).

These are consumers who are strongly interested in sustainability issues and are also very well informed. For this reason, responsible practices are a key purchasing criterion, on par of style and quality, and are willing to pay a green premium; as a matter of fact, these people have a higher income compared with the previous categories. This segment can be further broken down into three subgroups: The enthusiasts (3%), for whom sustainability is the key purchasing driver, the high involvement (10%), and the believers (3%) (Global Fashion Agenda et Al., 2019). The last classification we want to analyze is the one conducted by WGSN Insight in the report "Future Consumer 2022". This segmentation is quite different from the previous ones, and the most interesting point is that it detaches from the classical market segmentation and concentrates its efforts in understanding what are the customer sentiments that are becoming dominant in our society and consequently connect them to spot future profiles of consumers. Moreover, having been conducted in 2020, this report manages to intercept the changes brought about by the pandemic that is already reverberating into new consumer sentiments and behaviors.

The report identifies four sentiments, which are combined, and identifies three consumer profiles. The first sentiment is *Radical Optimism* according to which, despite the great uncertainty of our times, optimism is a brave choice that several people are making. Even though the media pose closer attention to negative news, many things in our world are in reality improving.

The cause of this negativity is to be sought in the increase in polarization of opinions and an in catastrophism, which bring people to overstate what is wrong and bad. A major change that is needed, would be to focus on what is true not what sells. The second consumer sentiment is called *Desynchronized Society*; after the pandemic, people continue to do many of the same activities, but no longer at the same time. People crave stability and routine, but society is getting the opposite, desynchronized. This leads to a lack of consistent human interaction and consequently a breakdown of communities, a real fracturing of our society. The third and almost consequent sentiment is *Equitable Resilience*; resilience is the ability to resist, absorb, recover and adapt successfully to adversity or changes. Nowadays this is an emotional priority to face increasing uncertainty and accelerated changes in outer conditions. Embracing negative emotions, without avoiding them, is beneficial, for example improving negotiation and decision-making skills. Finally, the last sentiment is *Fear* which is defined in the report as the most prevalent sentiment in the survey sample. Fear is analyzed as two main distinct concerns. On one hand, it deals with environmental and climate change, evidenced by the fact that a 2019 WSGN climate survey highlighted that 90% of global respondents said they feel uneasy about their future because of the environmental crisis. On the other hand, it relates to financial fear, caused by continued market shocks since the 2008 crisis and exacerbated by the post covid economic crisis.

Interestingly, even among the countries with stable economic growth, financial fear is spreading, and the answer may lay in the emotional contagion and fuel by digital connectedness. These four global behavioral drivers will impact consumer mindsets and WGSN Insight foresees three consumer profiles.

1. The New Optimists

They range from Gen Z to Boomers and have a vivacious appetite to embrace joy, a brave choice in the face of uncertainty and increasing fear. Younger generations have seen first-hand the negative impact of visual stereotypes, and demand visual equality for all, fighting the youth-obsessed culture by celebrating all ages. Companies will need to create products and services that meet properly their lifestyles, focusing on hyper-local delivery, streamlining the user experience for in-app ordering, and embracing joy and celebration. Brands that focus on hyper-local, last-mile deliveries, for example, festivals, outdoor venues, and sporting arenas are likely to gain market share.

2. The Settlers

They are in particular Millennials and Gen X, characterized by the willingness to plant roots in their community. They do not want to sacrifice their careers but prioritize work-life boundaries, fighting the *workhism*, the religion of work, and productivity. Settling down in a community means giving rise to a new era of localism. An interesting strategy identified to copy localism and sustainability is actioning the archives, in other words, selling restocks and exclusive pieces recovering materials from past collections. Additionally, social commerce platforms may become strategic partnerships to engage active users.

3. The Stabilisers

Mainly Millennials and Gen X, they react to the desynchronization of society and feelings of chronic uncertainty, by prioritizing stability. Self-improvement gets to be crucial, fighting the cult of productivity but seeking optimization of both careers and personal lives, bodies, and time. Simplicity is the main leverage to engage Stabilisers; since they already feel overwhelmed, they want a simplified and calm retail experience (brands can leverage on lights, noise, and practicality of retail spaces), and a reassuring relationship with brands.

6.6. CONCLUSIONS

This chapter had the purpose to get to know better the younger generations and so the next actors of our world. It has given us a lot of insights necessary to elaborate on any future scenarios.

We have seen how Millennials and Gen Z are generations that rely heavily on the use of digital devices, and above all, that are very comfortable in collecting and cross-referencing information. They are radically different from the older generations, not only for their confidence with the digital but also for their healthy and conscious lifestyle. They feel anxious and even ashamed when their daily life is not aligned with their conscious approach to life. They are also very conscious of what happens every day in our world and do not sit on the sidelines. We can define them as a generation of activists, a new paradigm of activism brought into to where they feel most comfortable, online. Social media have become organizers for the battles that are closest to the heart of these generations: climate change, ethnic inclusion, gender identifications are taking people to the streets to shout out loud a need for changes. The implications for businesses are numerous. First, we have seen that these generations require a radical shift of business paradigm towards a more purpose-driven approach. Companies need to take a stand and with real actions demonstrate their commitments. Beware, that these generations are not satisfied with what companies preach in marketing and advertisement, they expect transparency and are very willing to search for the truth. Consumption for them is a matter of ethical concerns, not of accumulation. They need to be engaged and need to trust brands and organizations. Additionally, the same youth will become the next generation of workers, and the motivation of employees will be strongly linked to companies' ethics and commitments. Digital channels offer wide opportunities to meet these next generations of customers, and companies must design new customer journeys that consistently integrate online and offline experiences.

These generations are tech virtuous and very comfortable in searching for information online; though, they also prefer to convert their purchase to physical stores. This model is known as click-and-mortar, starting with a digital engagement and converting init to a physical space. However, these generations, pose challenges to businesses. They complain of having too many online alternatives to the point that a brand can be out of mind in just 8 seconds. For companies, it will be critical to access influencers and personal networks to convince customers, exasperating personalization into the so-called segmentation of one. Advanced data analytics will support the design and management of trans-media storytelling, but still, the process will be time-consuming and costly. Social media and SEO optimization will be key to getting maximum value and loyalty from these generations and raising brand awareness, improving the perception of brand image. We have shown some of the future customer segmentation, which helped us in understanding better possible development of customers' interests. We will face the boom of *LOHAS®*, a cluster of people prioritizing personal and planetary health. Still aesthetic will remain a fundamental selection criterion, and the level of attention to sustainability today is still too low, with only 16% of the population highly involved in sustainable practices. Though, especially the youth is willing to experiment with alternative products and business models. Finally, a very interesting segmentation by WSGN Insight, foresee three kinds of consumers' profiles: the *new optimists*, who make the brave choice of embracing joy and fight the youth-obsessed culture, the *settlers*, who plant roots in a community and seek localism, and the *stabilizers*, who react to desynchronization of society and seek optimization of their lives. Now that we have explored the main areas of interest for our work, we have collected all the insights needed and we are ready to project ourselves into the future. We will experiment and define scenarios of evolution for fashion and our world, which are meant to stimulate our minds and challenge the status quo.

PART I

RESEARCH GAP & BACKGROUND

2.

2.1 GAP IDENTIFICATION

Along with our literature review, we have talked extensively about the fashion industry from numerous perspectives. Fashion is a form of art, a cultural-intensive industry, which reveals the aesthetic sensitivity of contemporary society, capturing and at the same time driving its evolution. It is a harbinger of tradition, but at the same time, it is increasingly eager to find new channels of expression, new styles, and new aesthetic canons. The continuous research for innovation breaks the settled schemes and often makes fashion the spokesman of social and political ideologies. However, fashion has broken its pure artistic soul, becoming in recent years synonymous with consumerism; one of the causes has been the affirmation of the fast fashion model. Born in 1989 with Zara stores (Maiti, 2020), it has brought a complete revolution in the way of doing fashion, which focuses on being as fast as possible, reducing impressively time to market. The brands adopting this kind of model, have structured themselves to become more and more agile and focused great efforts in collecting and analyzing information about the latest trends and feedbacks from customers; they successfully couple short lead times with fashionable, updated, and always effective products. Additionally, by exploiting huge economies of scale, fast fashion companies have managed to profoundly reduce prices, not only achieving the commendable goal of democratizing fashion but degenerating into consumerism. Apart from the loss in meanings and value of fashion products, which is in our opinion a major defeat for a so cultural-intensive and product-centered industry, the problems, unfortunately, are much more complex. Indeed, fast-fashion diffusion has initially disrupted the industry but year after year it has inevitably affected also those companies which had different business models but saw their market shares at risk. In this way, the fast-fashion business model diffused some of its features in almost every firm operating in the industry. Is this the kind of fashion we want for the future?

One might argue that low prices are necessary to reach the wider public, breaking up the exclusivity barriers that fashion has always erected in its history, and concretizing the concept of fashion democratization. We do not oppose in any way this idea of a more inclusive fashion, but we cannot accept the fact that this comes at an incredibly high price. In chapter 4 of our literature review, we extensively analyzed the threat that fashion represents for our planet. From the customer perspective, the continuous expansion of products lines coupled with their low prices, provoked an important change in behaviors: fashion items can be bought quickly, easily, and at a very low price. Clothes have lost value in the eyes of customers, becoming an object to consume and dispose of once it has no marginal value.

Fashion has broken its pure artistic soul, becoming in recent years synonymous with consumerism; one of the causes has been the affirmation of the fast fashion model.

From 2000 to 2015, the utilization of a garment, meaning the number of times it is worn, has decreased by 36% and at the same time overall production has doubled (Ellen MacArthur Foundation, 2017). The devaluation of products combined with the acceleration of purchasing process, have caused a tremendous demand increase yet no one has really cared about the end-of-life management. Tons of fashion wastes have simply been landfilled every year, hidden from the public eye. The production growth has dramatically worsened also the environmental impacts of processes, which have never distinguished themselves for being environmental friendly. Globally distributed supply chains exploit unethically the unbalances of our world, producing many negative externalities, especially for workers in the early stages of the value chain, and widening more and more the existing social gaps, rather than fighting them. Production has been relocated to developing countries, especially in South-Asia, where workers are often exploited, paid with a minimum wage that can be even one-fifth of a living wage (Clean Clothes, 2017).

To compensate for low wages, workers are forced to stand extremely long shifts, averaging 14 to 16 hours (Charpail, 2017). This is the reason why we got to the point of defining all of this with the term *modern slavery*, which counts about 40 million people living in this condition (Freitas 2019) and child labor is often involved in these dynamics. Numerous scandals have denounced the precarious conditions of fashion workers and the most (in)famous is that of Rana Plaza, which in 2013 caused the death of 1134 people (Fashion revolution A, 2020). In a few words, the fast-fashion business model diffusion has driven the whole industry through a dangerous path, forcing all companies to be fast and efficient. This recipe does not include any focus at all on sustainability issues (Niinimäki et Al. 2020). As a result, the fashion industry is reported to be the second most polluting industry after oil (Charpail, 2017). The industry uses up to 44 trillion liters of water annually (Gabi, 2018), apart from the water polluted using chemicals in manufacturing and finishing processes. It is the main source of microplastics released in the ocean, being responsible for 35% of them (Wagner, 2020). Lastly, chemicals represent another relevant threat to both terrestrial and freshwater ecosystems since it is estimated that over 15 000 different chemicals are used during the production of fashion items (Roos et Al. 2019). It is quite evident that the fashion industry is unsustainable for our planet and with the global population as well as the average wealth growth, the trajectory is worrying. Despite a sustainable transition that has already begun (at least in terms of commitments) for a lot of industries, only in recent years big fashion players have begun considering sustainability as an important issue. One may argue that it is only a strategic move to respond to changing customers' preferences, but it is fair to say that several fashion companies are taking the issue seriously and are taking concrete actions to fight these problems. The advent of the pandemic has also disrupted the global economic and industrial system, showing the weaknesses and risks of far in distance supply chains and this holds especially true for fashion. Indeed, the whole industry relies profoundly on China, for almost any step of the value chain; in the earlier stages of production, China holds around 60% of global fashion production, from raw materials to weaving and knitting (UN Environment Programme, 2020).

The advent of the pandemic has shown the weaknesses of far in distances value chains and made fashion companies realize they must intervene and modify their sourcing mix, to better balance risks, costs and supply flexibility.

This over-reliance of the fashion supply chain on a single nation nullified any attempt of diversification strategy since the global supply chains showed their inability to fulfill the whole demand without China's contribution. With the spread of coronavirus throughout the countries and the subsequent containment policies, all the upstream players faced hard times: only the larger-scale suppliers, with a multi-national footprint, managed to gain an advantage (McKinsey et Al. 2021). Fashion companies have understood that they must intervene to modify their sourcing mix to better balance risks, costs, and supply flexibility. It is expected that China's role as a leading raw material supplier may be challenged following the pandemic and we will witness a stronger backward integration of regional supply chains (Berg et Al. 2018). Another phenomenon catalyzed by the pandemic is the transition towards industry 4.0, characterized by a strong digitalization of almost all the processes. In the design phase, the development of 3D product development and prototyping, which have made it possible to reduce the number of physical prototypes, cutting costs, time, and waste. For wholesales, digital showrooms shorten the sell-in period and thanks to the development of avatars and blockchain, new opportunities are opening to interact digitally with users. Marketplaces are on the rise, as well as a more pervasive use of artificial intelligence which can deliver significant speed, cost, and flexibility improvements across the value chain. AI helps manage and interpret the vast amount of data that are today available and come from almost any step of the value chain and finally improve customer as well as suppliers' relationships (Bertola, 2021).

Fig. 111 – Research Gap schema, from present challenges to long-term visions of fashion.
Source: Author elaboration

Not only at the firm level have we had significant changes but also at the customers level, who have been forced by the pandemic to change their behaviors. Remote working has caused the growth of less formal product categories, such as casual wear and sportswear (McKinsey et Al. 2021). Obviously, due to shelter-in-place orders, people began to buy more and more online, a habit that will persist, albeit in a reduced way, even in the post-pandemic period. Furthermore, the pandemic seems to have awakened social consciousness (Adyen, 2020), which is even more true among the younger generations, Gen Z, and Millennials. They are very sensitive to social issues, including gender identification and ethnic inclusivity, as well as environmental issues. These generations are willing to experiment with new business models, that respond to the need for purpose, fighting for a cause, for example protecting our planet through more sustainable and often circular business models, such as clothing rental models or second-hand purchasing (PwC, 2021). All these transformations are defining a new landscape for fashion companies, that need to identify a new course, consistent with people's needs and desires, as well as coping with the environmental and social crisis we are living in.

Fig. 111 helps synthesize the major changes in act that have emerged from our research work. The first term encountered in sustainable transition, by which we mean the process of transition that is already underway in many industries, such as mobility, construction, or energy, to respond to global and systemic environmental challenges.

We must ask ourselves, where is this great wave of change leading?
Which will be the dominant paradigms of the new era of fashion?
This is the right and one of the last opportunities for the fashion industry to shift paradigm, embracing more sustainable, and inclusive ways of doing business.

Covid-19 disrupted our world and the fashion industry, which up to that point had implemented only very marginal measures to face the sustainability issues. Yet the pandemic has caused an urgency of change, which necessarily will force actors to renovate themselves and the whole fashion system. We must ask ourselves though, where is this great wave of change leading? Which will be the dominant paradigms of the new era of fashion? Covid pandemic made us realize that we live in an increasingly uncertain world and that it is impossible to predict how the future will be. This happens because, in our connected world, any unpredictable event spreads immediately on a large scale and in a sudden manner. Therefore, we need guidance in this uncertain moment so that this opportunity for change is not wasted. This is the right and, we would say, one of the last, opportunities for the fashion industry to shift the paradigm, embracing more sustainable, and inclusive ways of doing business. With our research, we take a future perspective to anticipate how the fashion industry might become in 2030. It is impossible to make exact forecasts, but we can imagine future scenarios. Not only we can imagine the future, but also we can imagine with a will, decide a preferred future and consequently drive our society in that direction. Our aim is not then to understand what to expect in the future, but rather we want our research to have an active attitude. We cannot describe only the evil side of the actual fashion industry; we cannot blame everyone for our future being endangered; we cannot wait for a revolution to come. We want to give our contribution in envisioning future perspectives and a transition pathway that could concretely lead fashion companies out of the tremendous actual situation and land successfully in a preferred scenario, where fashion is an example of sustainability. Indeed, we want companies not only to be able to set a clear vision but also to elaborate a transition plan, with concrete actions to change the industry day by day and measure their progress along the way.

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We want to give our contribution in envisioning future perspectives and a transition pathway that could concretely lead fashion companies out of the tremendous actual situation and land successfully in a preferred scenario, where fashion is an example of sustainability.

2.2 DESIGN & MANAGEMENT BACKGROUND

A robust methodology is crucial to achieving any relevant result in a research work that is why we want to give enough space for describing the methodological background we referred to and position our research within the study fields of our academic career, which may not appear clear at first sight. During our Master of Science in Management Engineering, we got in contact with the *Design* discourse, particularly thanks to the Design Management Laboratory. The entire course was aimed at exploring the middle ground between Design and Management engineering since the two disciplines have more features in common than one could imagine. Innovation is the main field of interaction, since both the disciplines are highly interested in this topic, just adopting quite different perspectives. Looking at academic research indeed, an early line of research coming from the design discourse has been blending during the last two decades with a great number of managerial and business scholars; we can mention Donald Schön, Klaus Krippendorff, David Kelley, Roger Martin, Tim Brown, Jake Knapp, and Roberto Verganti among the others. Design thinking has then emerged as a successful paradigm for innovations, especially for its versatility. Different methodologies have been developed to achieve different objectives: design thinking can enable creative problem solving or quick product development and launch, it can nurture a creative mindset in an organization, and can envision directions, business models, and strategies (Dell'Era et Al. 2020). "The etymology of design goes back to the Latin *de + signare* and means making something, distinguish it by a sign, giving it significance … Based on this original meaning, one could say: *Design is making sense (of things)*." (Klaus Krippendorff, 1989). Design is a creative force, able to envision and attach meanings to physical artifacts or intangible assets, but it is not a merely creative effort.

It is a process, where creative insights are nurtured through deep continuative research and supported by structured planning and managing activities (Bertola et Al. 2020). Contemporary design is strongly interrelated to business and management if we think about Product and Service System Design (PSSD), which does not consider isolated solutions, rather complex systems made of stakeholders and exogenous factors. We see then the relevance of Design within the business landscape and this gets to be even clearer by exploring our essence as Management Engineers. We are "engineers of change and innovation, trained to design and manage systems in which technological variables interact in a complex way with economic and organizational ones … able to design solutions by applying the engineering approach (learning, reasoning, and modeling based on a solid multidisciplinary preparation) to face problems and opportunities. In addition to design, the Management Engineer can organize and manage company resources in an integrated way and promote innovation in all business processes" (Politecnico di Milano, 2021).

Management and Design shares a common interest towards innovation. If on one hand Design can provide Product-Service Systems and Intuitive thinking, Management can contribute with Business Models and Analytical Thinking.

Considering management engineering as a purely administrative topic would be a limited perspective because the most important capability is to manage change and innovation within complex systems and nurture innovation as a key strategy to achieve long-term business sustainability, approaching it systematically, by considering all stakeholders and the complex interrelated phenomena. Management and Design shares therefore a common interest towards innovation. If on one hand Design can provide Product-Service Systems and Intuitive thinking, Management can provide Business Models and Analytical Thinking (Dell'Era et Al. 2020).

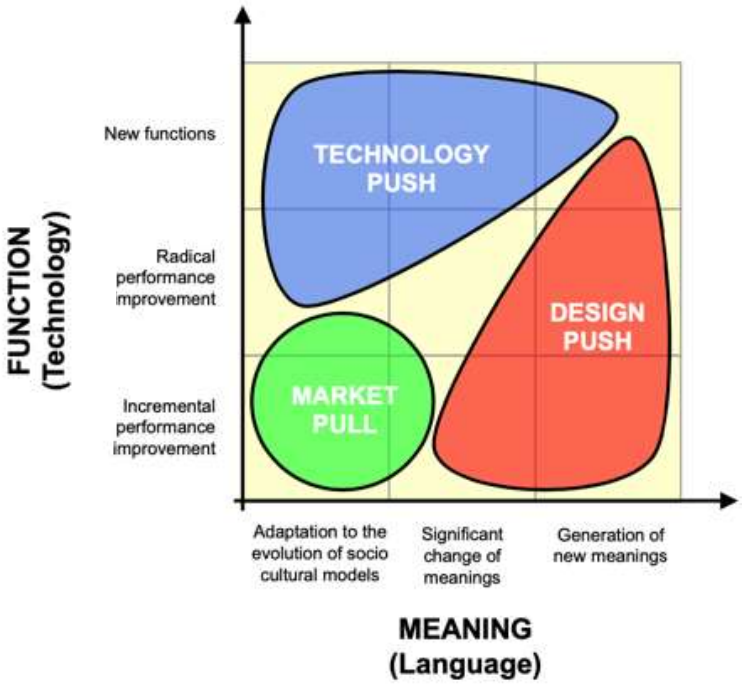

Fig. 112 – Classification of innovation strategies according to functions and meanings. Source: Verganti et Al. 2018

Several are the possible strategies that fit different innovation projects, and a classification distinguishes three different strategies to drive innovation (Fig. 112). *Technology-push* is a process driven by scientific or technological competencies and typically revolve around new functions or radical improvements of solutions. *Market-pull* innovations typically involve the way in which a solution is commercialized, in terms of organization, distribution, advertising, and provide incremental performance improvements of solutions. Finally, *design-push* innovations are driven by socio-cultural and semantic competencies and typically revolve around intangible attributes (Verganti et Al. 2018). In other words, design push innovation has the power of generating new meanings that do not adapt to the socio-cultural model but rather drive its evolution. Interestingly, also technology push innovations may generate new meanings when the solutions are breakthrough and affect interaction with users and even the wider context. Design push strategy instead starts from the very beginning with the goals of renovating meanings by innovating the wider context and then converging to the solutions that best adapt to the new socio-cultural models. Indeed, if we consider a typical design problem (Fig. 113), we can identify two distinct phases. The deconstructive phase requires highly analytical

Design push innovation has the power of generating new meanings that do not adapt to the socio-cultural model but rather drive its evolution, and then converging to the solutions that best adapt to the new context.

thinking to interpret in details products, the interaction with people and the wider context in which the interaction takes place. This is critical to have a clear understanding of the problem, precondition for any designing effort. In the second phase, we envision at first the new wide context and then narrow down the scope to interaction and finally to the solution. With this exemplification of a design problem, we want to introduce some main features of a typical design process: *human-centrism*, *holistic approach*, *ambidextrous thinking* and *iterative progression*. The first characteristic of a design approach is undoubtedly being human-centered, meaning that the process starts with the people and ends with outputs tailor made to suit them; to do so, building a deep *empathy* with people is necessary to create meaningful innovations (Dell'Era et Al. 2020). Adopting a human-centered approach implies understanding users at the very beginning of the process, their needs, their relations with products and services, and translating these elements observed into characteristics of new solutions. With a strategic vision and a design process, it is even possible to generate new user behaviors. A second principle is a holistic approach, meaning that it is necessary to face problems systematically rather than splitting them into subproblems to face separately. It becomes crucial the capability of zooming in and out at the right level of detail is needed, without losing the holistic view. The third principle is ambidextrous thinking. In his book *The Design of Business*, Roger Martin says: "The way I think about design thinking is it is a halfway house between analytical thinking, for the purely deductive and inductive logical thinking that utilizes quantitative methodologies to come to conclusions, and intuitive thinking, the knowing without reasoning.

And design thinking is the kind of thinking that takes the best of both sides" (Martin, 2009). Complexity of problems is growing continuously as well as uncertainty, in a way that the only analytical thinking is not enough anymore, but we need ambidextrous thinking: on one hand data allow to make incredible analysis but on the other hand, intuitions identify the portion of data we really need and create meaningful information. Abductive thinking is then a completely different way of thinking compared to deductive and inductive reasoning; it is the art of guessing "what it might be" when we spot a contrasting signal in the reality, it is an attempt to understand the present in light of the possible (Dell'Era et Al. 2020). Deductive, Inductive and Abductive thinking are different thinking processes but with the same goal, making sense of perceptions. But there is other two ways of thinking that well fit within the scope of our research work, speculation, and moral imagination. These have a different goal compared to the former ways of thinking, which is breaking sense and giving new ones. Speculation thinking means creating new images of what it might become, it means imagining possible futures and proactively changing the scenario. Moral Imagination is the most sophisticated thinking and means imagining with will what the future should become, it is a matter of forging a desired scenario (Verganti et Al. 2018).

Human-centrism implies understanding users by means of empathy. Holistic approach faces problems systematically, zooming in and out anytime. Ambidextrous thinking combines wisely analytical thinking with intuitive thinking. Iterative progression is to cope with uncertainty.

The last principle of a design approach is the iterative nature of progression. Indeed, the problems faced are often ill-defined and more and more complex, so the level of uncertainty is extremely high. The best way to proceed is therefore by iterations, revising continuously the previous steps to perfect consistency and robustness of the whole innovation project (Cautela et Al. 2020).

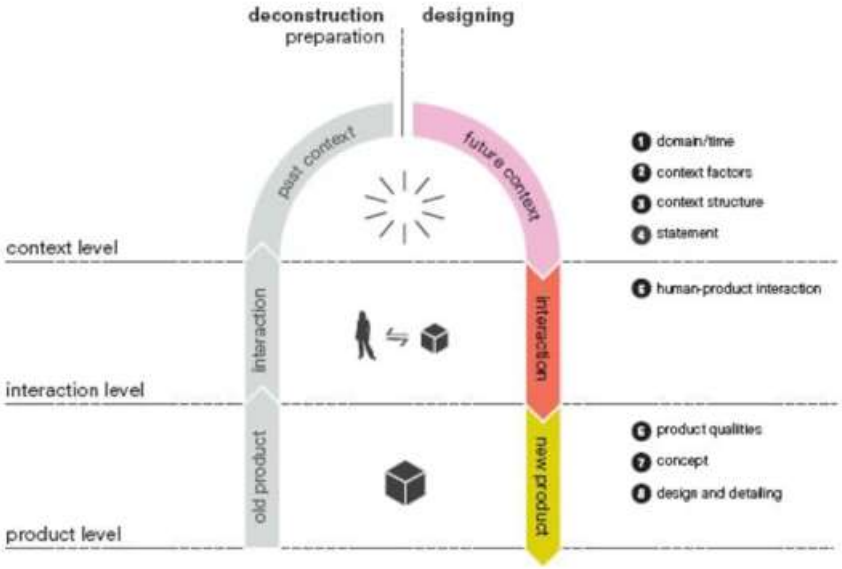

Fig. 113 – Design Problem representation as a sequence of deconstruction and designing phases.
Source: Cautela et Al. 2020

2.3 FUTURE STUDIES METHODS

"The best way to predict the future, is to invent it!". This quote by Alan Kay emphasizes that it is a futile effort to try to accurately predict the future. Futures thinking is an approach that considers what is likely to change and what is likely to stay the same in the future, to be more reflective in strategic planning. This methodology provides us with a framework that stimulates dialogue about the world today and what the world will look like in the future. It is not based on predicting the future at all. In fact, future thinking studies the potential of speculation and anticipation to inform and incite change in the present tense (Angheloiu, 2019). The future is used as a space to rethink what is possible so that we are not shocked or blind-sided by unexpected consequences. To better understand how to approach this methodology, Marina Gorbis identifies "5 principles to thinking like a futurist". The first one is *forget about predictions*, which echoes what was said earlier about the impossibility of predicting the future. Thanks to the use of big data, in recent years progress has been made in predictions, though for those predictions that focus on one event, such as the success of a product introduction. However, predicting large and complex changes, that involve connections between technologies, society, economics, and organizations is still extremely difficult. Above all, because what is important to grasp a change is the complex underlying transformation. To better understand this concept, we can think about the difference between waves and tides. Waves are what we see on the surface, fleeting events, which appear and disappear. But there is something bigger underneath that is causing all the waves, the tide, which causes all kinds of disturbances of which waves are just signs. Our work involves indeed trying to understand those tides: we observed in our literature review some of the changes that are happening in our world and our society, trying to understand the underlying transformations.

Thinking about the future is also an imagining effort. It is about transforming how we think, creating a map of the future, and seeing the big areas of opportunity. To stimulate imagination, the following model is proposed: F – I – A process (fig. 114).

Fig. 114 – Foresight to Insight to Action framework. Source: Gorbis 2019

When developing foresight, we should ask ourselves what they mean to us, what are insights we can get. The same foresight, the same possibility, or the same tide may offer very different insights depending on the type of industry or organization that is reflecting on it. Ultimately the goal is to use this foresight and the resulting insight to determine concrete actions to be taken. We need a real output, able to start a transformative process. Although the foresight are usually five to ten years ahead, the actions may be needed today or in a few months from now.

The future is a space to rethink what is possible so that we are not shocked or blind-sided by unexpected consequences. Ultimately the goal is to determine concrete actions to be taken today.

The second principle is *to focus on signals*. The future does not have data we can use, everything we have at our disposal is from the past. However, if a scenario is changing, how can we understand how it will evolve? William Gibson said, "The future is already here, it's just not very evenly distributed."

Therefore, some signals of the future are already around us today. A signal can be anything: a technology, a product, a service, an experience, an anecdote, a personal observation, a research project, or a report. Signals are a key part of the future thinking process, so they will be analyzed more in-depth hereafter. Despite there being no data about our future but only about the past, in history, there are large patterns that show themselves repeatedly. Therefore, the third principle is called *look back to see forward.* We can understand by looking at the past some analogous transformations that have already happened and which could help us anticipate consequences. Collecting signals and connecting them to a larger historical context, help us *uncover patterns,* which are those tides mentioned before. The logic behind this is described by the Two-Curve Framework (Fig. 115); in any period of large transformation, we are simultaneously living along two curves. A descending one, that we have been living for a long time, and whose rules, contexts, and usage patterns are well known, and it is slowly declining. At the same time, a new way of doing things is emerging: a nascent curve, of which we can detect only the first signals of change.

Fig. 115 – The Two-Curved framework.
Source: Gorbis 2019

Signals are the *basic building block* of any future thinking effort. They are tools to see in the dark of the future, and trigger some questions about the future which may help us avoid future shocks. With signals we see future coming and have time to adapt or to steer to a different direction.

The last principle is *creating a community*, since thinking about the future is a collaborative and highly communal affair. It requires a diversity of views to become robust. We need to involve different domains, different ages, experts and non-experts since collective intelligence can be very beneficial. After this introduction to future studies, it is fundamental to go a bit more in detail about one of the concepts that were introduced earlier: signals. The signals are indeed the *basic building block* of any future thinking effort. They are tools to see in the dark of the future, "A signal is a specific example of the future in the present" (Marina Gorbis, 2019), they are real and concrete anticipations. Signals are important because they trigger some questions about the future and may help us avoid future shocks. With signals we see the future coming and have time to adapt or to steer in a different direction. Despite what we described so far being basic for future studies, there are different processes of future thinking that can be used. These methodologies are not strictly exclusive and can influence one another but a useful tool to understand which typology is better to start with is shown in fig. 116. This map is to position the future of the topic of interest and consequently identify the best typology of future methods to use. The first dimension is an objective evaluation of whether the future of interest is getting better or worse.

On the other axis, we assess subjectively the type of influence we can have on this future, whether we are super powerful or powerless in facing and driving the future.

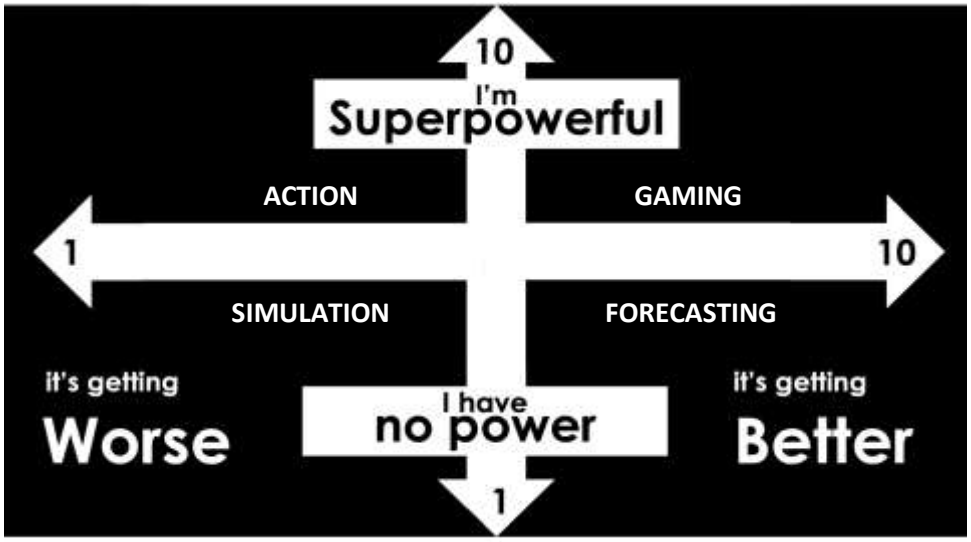

Fig. 116 – Map of Future Thinking Methodologies.
Source: Institute for the Future 2020

According to which quadrant the future is positioned, we can resort to four different approaches:

FORECASTING SKILLS: when future is getting better but we have no power so we can just become better prepared to adapt and react to changes. We gather signals, analytical and creatively elaborate drivers of change and finally turn into scenarios.

SIMULATION SKILLS: when future is getting worse, but we feel powerless. Simulation methodologies allow to overcome neurological obstacles that make it harder to accurately predict how we would feel and do if a future arises. We tend to make faulty assumptions and convince us that we have less power. Through first person simulations of future, we can instead increase confidence.

COLLABORATIVE GAMING SKILLS: future is getting better, and we also feel powerful. Then the need in this case is to expand our personal vision by engaging as many people as possible, to incorporate different perspectives. Collaborative gaming techniques build empathy and conjugate different sides of the same future, reducing the risk of being blind-sided by future consequences.

URGENT OPTIMISM (ACTION) SKILLS: future is getting worse, but we have the power to act on it. We need than to make real positive change in daily life, work, and the world around. We can create and share preferred stories of futures, highly persuasive compelling visions of the changes that we want to make real. Based on a preferred future it is possible to identify obstacles, recruit allies, collect resources and plan actions to make the vision real. Every action we take today changes the future, and urgent optimism help identify the action roadmap that would make the biggest impacts, by acting on the most urgent challenges of our world and our society (McGonigal, 2020).

Our research topic is the future of fashion, and we can confidently say that the future trajectory is worrying, for all the sustainability issues that have been deeply analyzed in the Literature Review. At first glance, we might think that we do not have a real power in transforming this future, being the problems of fashion systemic and out of the individual sphere of action. On the other hand, as customers we have the power to drive demand changes, by adopting new consumptions behaviors and requiring out loud changes. Additionally, as Management Engineers we could one day become leaders of this same industry and drive it from the inside through all the transformations that are needed. For these reasons, we position our research in the upper-left corner and urgent optimism is then the approach needed. Indeed, we do not have time to complain but we need to be endlessly optimistic and act immediately, by transforming fashion industry and giving our contribution to the planetary rescue.

2.4. TRANSFORMATIVE INNOVATION

We have discussed extensively that our world is getting more and more uncertain, and because of this we may fall into the trap of feeling powerless when confronting the future. Design can help increasing clarity, and specifically what it is called *transformative design*; we can leverage on design not only for successful Product Service Systems but also to realize transformative innovations. We wholeheartedly recognize in the pillars of transformative design, such as democracy, cooperation, respecting rights, living in harmony, interdependency, and regenerative processes. How can design concretely help in this direction? Design creates ideas and solutions, but we need personal meanings of *preferred future*, meaning that it is not enough to foresee the future, but we need to choose what is the future we really want; this topic will be discussed again going on in this chapter. Moreover, design permits visualization, which is useful to effectively communicate to others, but we still need critical conversation for building *shared meanings*. Individual meanings are not enough if we need to transform our world, but we need to engage in a conversation to find shared meanings of preferred futures.

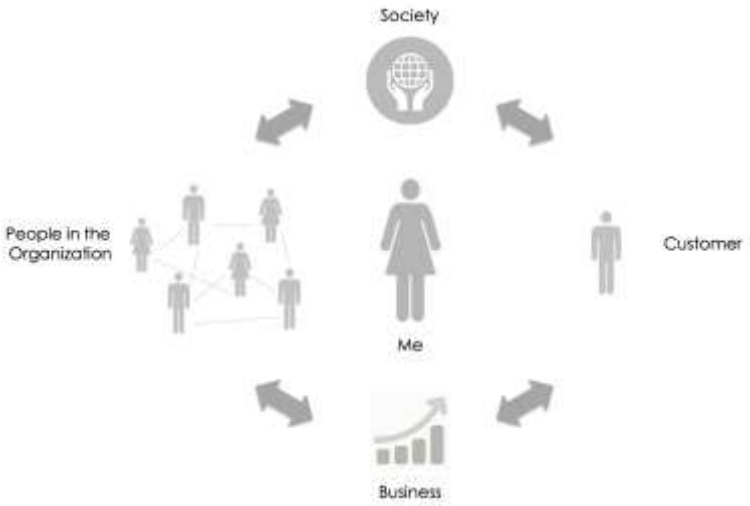

Fig. 117 – Individual and Collective balance of meanings and purpose. Source: Verganti et Al. 2018

Finally, design contributes to *culture*, elaborating on meanings of objects, actions, places, experiences; it shapes our present perceptions of reality, but we need collective commitment to make the conceptual transformations real. Summarizing, design helps us in creating ideas, visualize them and can shape our culture, but we need individual and shared reflections along with collective commitment to realize major transformations of our society (Cautela et Al. 2018). It appears quite clearly that it is crucial to successfully engage people, and from this perspective, transformative innovation is a matter of leadership. "Leadership is a practice whereby an individual engages and is engaged by a group of individuals to achieve a shared purpose" (Verganti et Al. 2018). We do not live, neither work as individuals alone, but always as members of a community. We as individuals need to balance our meanings with those of a wider system, elaborate individual and collective visions (Fig. 117). The economic force has proven to have probably the strongest transformative power, along with other few forces that shape our world continuously. Demand drives changes every day, and at the same time, product and service innovation continuously transform incrementally and sometimes more radically our system. Individuals, family, municipalities, states, companies, ONG, and almost any organization in our world are all subjected to the economic force and continuously adapt to the changing society. Therefore, business managers, being the conductors of this powerful economic force, can and we would say ought to behave as leaders of the transformations that our society and our planet desperately need.

Transformative innovation is a matter of leadership. Business managers, being the conductors of the powerful economic force, ought to behave as leaders of the transformations that our society and our planet desperately need.

Critical becomes therefore the identification of a shared purpose and as of today, we are living a crisis of imagination, not of solutions. Identifying a shared purpose and a clear direction is the most critical part of an innovation project, and this is where design and future studies can help, by tackling this imagination gap. Recent development has approached design as a practice focused not on solving problems (outcome-oriented mindset) but rather on asking "carefully crafted questions" (and therefore inquiry-oriented mindset). Different sub-fields have been developing in last years, from industrial design to the more intangible realms of speculative design, design fiction or transition design. Fig. 118 reports the mapping method adopted by Angheloiu (2019) based on a previous map made by Montgomery. At first sight, we can understand quite evidently the vastity of alternative design disciplines, as well as the overlapping area between Design and Strategy.

Strategic thinking is suitable to obtain incremental changes, but rather we need to use design and futures methods, which enable conversation about the paradigm shifts in values, ethics and societal norms that are desperately needed today.

This map considers not only the rigidity and constraints of processes and methodologies as Montgomery did but map the sub-disciplines across two axes: attitude towards strong sustainability and attitude towards change.

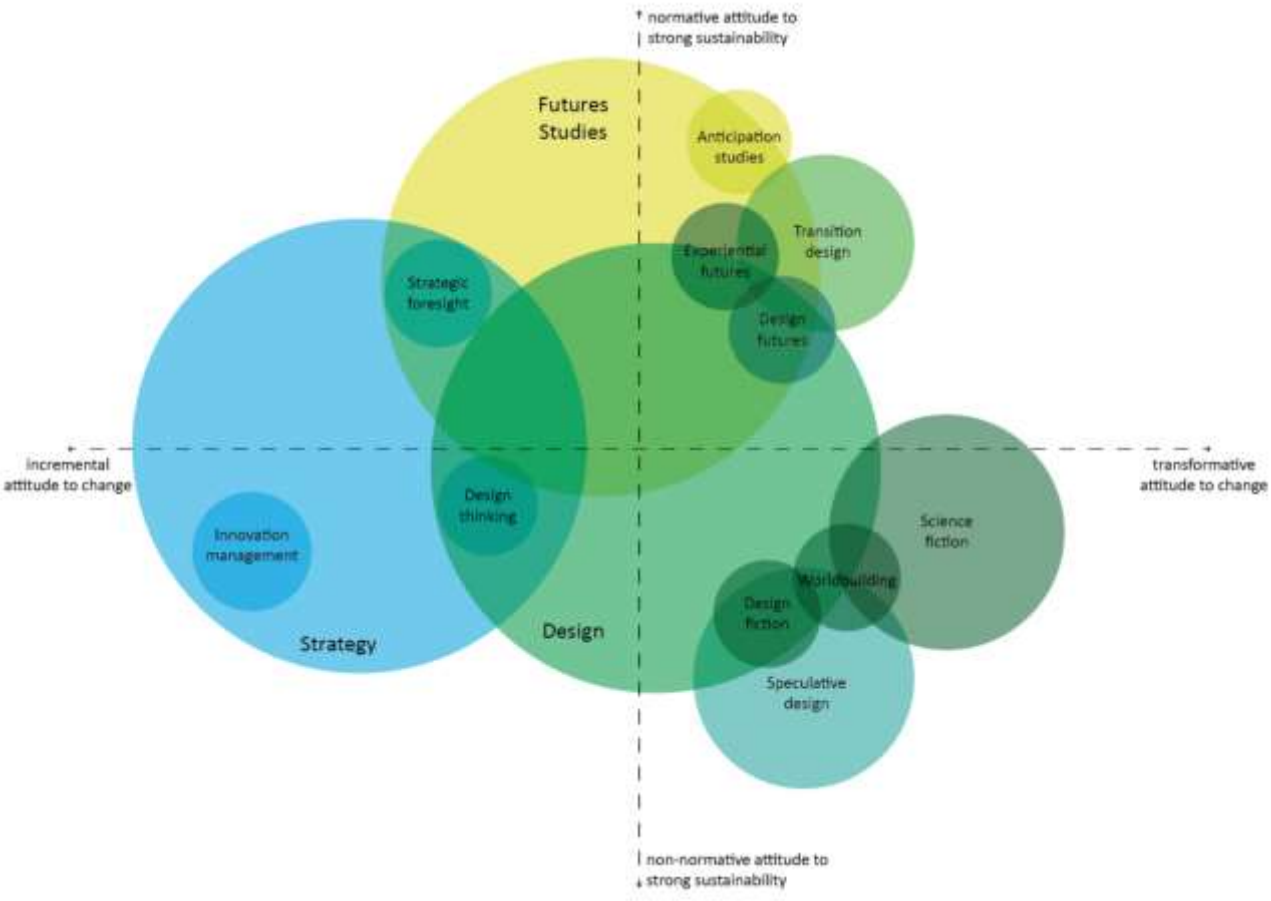

Fig. 118 – Map of attitudes towards change and sustainability.
Source: Angheloiu, 2019

"While strong sustainability acknowledges that natural capital cannot be replaced by economic or social capital, the transformative attitude to change axis implicitly requires a paradigm shift beyond the current socioeconomic system in order to stay within planetary boundaries" (Angheloiu, 2019). To achieve deep transformative innovation, as we intend to do in our research, it is necessary to adopt a quite transformative attitude to change current socio-economic paradigms, but above all to take a normative approach to sustainability, since regenerating the natural capital that is being wasted, has become an absolute priority. We cannot rely only on purely strategic thinking, which is suitable to obtain incremental changes, but rather we need to use design and futures methods, which enable conversation about the paradigm shifts that are needed in values, ethics and societal norms. Besides, future methods have been already used by business and policymaking as strategic foresight, which has though a different goal. If strategic foresight is to preserve the status quo, future methods and design actively explore alternatives to the status quo. The attitude of our research is instead highly transformative since the actual challenges of fashion industry are rooted in complex and established mechanisms which need to be transformed radically. On the other hand, sustainability is the pillar of the whole research, and the main need of today society. For this reason, the positioning of our own research methodology is to be found in the middle ground between future studies, design, and strategy, to cope on one hand with the need of a solid and systemic transformation that foster sustainability, but on the other hand to keep a close eye to business strategy, so that we can leverage on the economic force previously introduced and make the transformative innovation a success.

The positioning of our own methodology is to be found in the middle ground between future studies, design, and strategy, to cope with the need of a solid and systemic transformation that foster sustainability, and to keep a close eye to business strategy, so that we can leverage on the economic force to make the transformative innovation a success.

2.5. A FORESIGHT FRAMEWORK

In the realm of transformative innovation and future studies, several are the methodologies that have been developed over time. We found very robust and comprehensive the foresight framework proposed by Voros (2003), because not only it summarizes previous versions of foresight processes, but also, he clarified the role of foresight within organizational boundaries. Indeed, foresight is an aspect of strategic thinking, concerned with exploration and options creation, based on PATCHY information. It differs from strategic planning, which is instead an analytical way of breaking down goals or set of intentions into steps, formalized, and implemented (Mintzberg 1994). But rather than foresight being a separatee and episodic occurrence, Voros sees it as an INTEGRATIVE part of the strategy development and planning.

Fig 119 shows the framework proposed, where the three phases are shown as interdependent activities, in a linear way. Foresight outputs become inputs for following strategy development and planning. This process is not linear, but iterative, since the foresights provide long-term visions that can be translated into new strategies. Fig. i also shows the typical nature of the questions to be addressed in each phase. Indeed, the type of thinking employed differs moving from intuitive, disruptive thinking, to assessment, to goal-oriented and pragmatic thinking. Strategic thinking is about synthesis, it is creative and experiential, rather than purely analytical and deductive. The typical questions according to us strongly help understand the differences between the phases; if foresight and strategic thinking tend to resonate with the question: “what might we need to do?'', strategy development asks the question ``what will we do?'', and strategic planning the question ``how will we do it?''. In brief, “strategic thinking is about exploring options, strategy development is about making decisions and setting directions, and strategic planning is about implementing actions” (Voros, 2003).

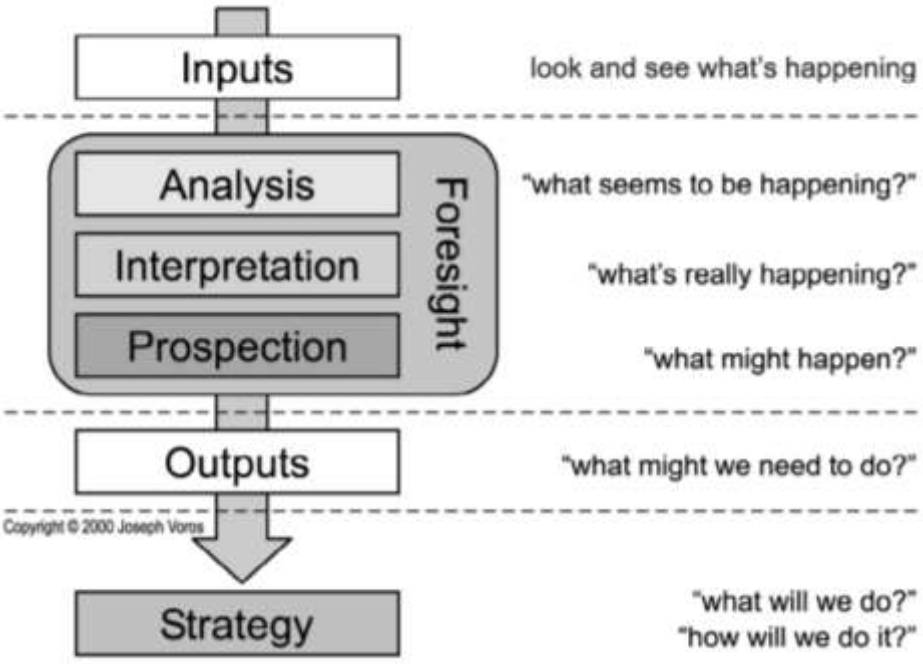

Fig. 119 – Foresight framework diagram in question form.
Source: Voros, 2003

For its completeness and direct connection with business strategy development, we decided to follow this same framework in our research. For this reason, we are going to discuss more in detail the steps of the whole process.

1. INPUTS

The process begins with Information gathering and several methodologies can be adopted, such as strategic intelligence or environmental scanning. In any case, information are collected about occasions, patterns, trends, and relationships within an organization's internal and external environment. As for the external analysis, three correlated environments should be studied at different layers, the industry, national and macro socio-economic environment.

2. FORESIGHT WORK

The foresight process per se, is organized in three sub phases:

Analysis

The first approach with data is to create order out of the remarkable variety of data collected. In this phase deductive and inductive thinking are crucial to answer an early question about "What seems to be happening". Trends analysis and polarities help systematically analyze the context.

Interpretation

In this phase, the effort is to go deeper in understanding "what is really happening?". Insights and drivers of change emerge in this phase with a major effort of deep understanding, to lay the foundations for the further phase.

Prospection

This phase enables to look forward and create various views of alternative futures, answering the question of "what might happen?". Visioning and normative methods, scenarios building are techniques useful to explore future according to principles of future studies methods previously introduced.

3. OUTPUTS:

The outcome of foresight work has both tangible and intangible attributes, meaning not only the actual range of options generated but also the changes in thinking that are generally required. The critical question in this phase is ``what might we need to do?'', which implies an extended perception of strategic options available.

4. STRATEGY:

In this last phase, the outputs of the foresight work become inputs for strategic development and planning. As previously mentioned, the process needs to be reignited, so that continuous re-assessments and corrections are possible.

Strategic thinking is about exploring options; strategy development is about making decisions and setting directions, and strategic planning is about implementing actions.
The outputs of the foresight work become inputs for strategic development and planning, but the process needs to be reignited, so that continuous re-assessments and corrections are possible.

2.6 SCENARIO BUILDING AND BACKCASTING

Realizing transformative innovation often involves complex systems, which are made not only of products and services, but consider entire value chains, and the wider socio-economic context. This is true in the case of innovation for sustainability, and surely the case of our research: innovating the fashion system means not only finding new solutions that improve sustainability incrementally, but rather it implies developing complex systems of products and services and reorganizing current value chain. We need also to act on a deep level, by redefining user perception of value behind fashion products and services, and consequently adapting the value chain and its actors. Scenarios are a valuable approach since they are "overall visions of something complex and articulated … a set of possible conditions, or transformations, affecting the domain under consideration"; scenarios "have to demonstrate a clear motivation (what the scenario is aiming at?) and practicality (the concrete actions that have to be taken to favor its implementation). (Manzini, 2009)

To build scenarios, we need to explore systematically potential alternative scenarios, by reconfiguring the high quantity of variables and actors involved. The polarity based approach is valuable in this direction since they show "possible variations along one dimension of a product-service system (PSS), between two opposite directions; for example, the relationship of users may be individual or collective, enabling or relieving" (Manzini et Al. 2009). By combining polarizations, we can identify new areas for solutions, and select the most promising directions to base a scenario on. There are no restrictive rules around the likelihood level of scenarios, this is because the main goal is not to describe a future scenario that is likely to happen, but rather to stimulate conversation around possible future, according to the principles of the future method that we discussed before. Voros (2003) describes futures in terms of likelihood with the Futures Cone (Fig. 120). Indeed, the future is not simply a linear progression of the present since it is impossible to make exact forecasts. Futures are then represented with a cone, that is our ability to spot future alternatives among all that is potential, even what is well beyond our power of imagination. Within the future cone lay four kinds of futures. Possible ones are those which might happen, even if they involve knowledge we do not dispose of at the moment. Plausible are futures that could happen, so not excluded according to current knowledge but depend on what is considered reasonable.

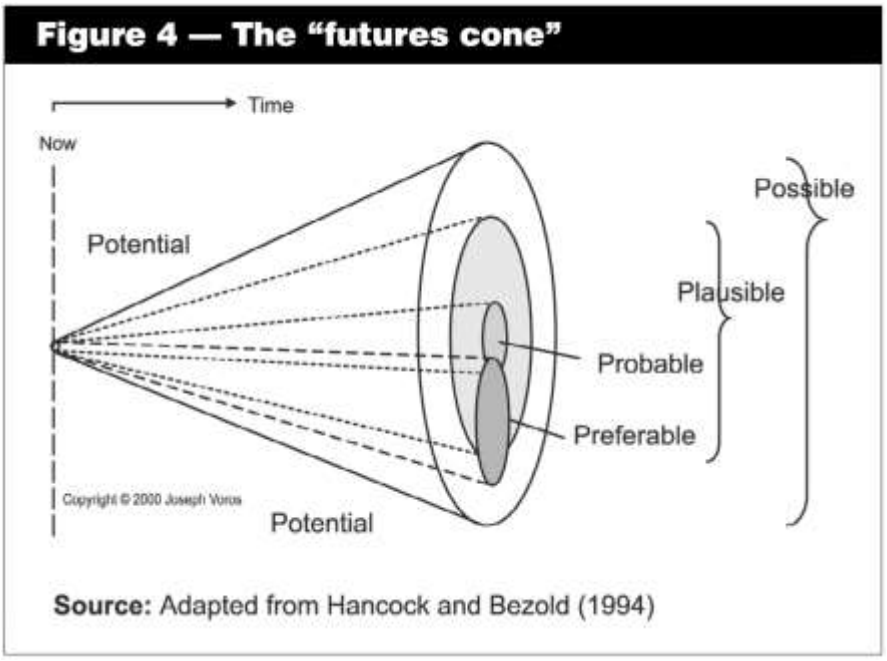

Fig. 120 – The "Future Cone".
Source: Voros, 2003

Probable futures instead are likely to happen, and simply are the continuance of current trends. Though the most interesting concept introduces is that of *Preferred Future*, which is not characterized in terms of likelihood, but rather is an emotional, subjective evaluation of what we want to happen. It is a matter of value judgments, which implies not only speculative thinking but also moral imagination, it is a view of the future filtered by our values and subjective perspective of the world. This concept of preferred future is crucial in the phase following scenarios building, namely backcasting. The basic idea of this process is to project back long-term visions of desired futures until the present, creating a transition pathway in which projects become steps in this transition. Three questions help in analyzing the transition needed; the first one is how to enhance and maintain the existing processes and systems that are already moving in the desired direction, and can therefore make the future more likely to happen. Secondly, it is interesting instead to understand which are the existing processes and systems which oppose the preferred future and consequently need to be overcome and marginalized. Finally, a last reflection must be made around what are the processes and systems that are not existing and could help make our preferred future more likely, so that we can envision or nurture these drivers (Gorbis, 2O19). Thanks to these questions, we can reason on the features that are fundamental for our preferred future to become real, and we can design a transition pathway that introduces the non-existing features, overcome those that oppose our vision and instead enhance those that realize our goal. Once the transition is designed, mid-term visions are useful to provide more tangible goals and objectives, to guide more precisely short-term projects, concluding the working back process until today.

Innovation for sustainability involves the development of complex systems of products and services, and the reorganisation of current value; a valuable approach is polarity-based.
A polarity shows a possible variation along one dimension of a product-service system (PSS), between two opposite directions.

PART II

ENVISIONING THE FUTURE

PART II

INPUTS

3.

150+

WEBSITES

110+

REPORTS

40+

PUBLICATIONS

30

STARTUPS

8

MoS Courses

Total Sources Gathered per typology

The first phase introduced by the foresight framework is that of input. This consists of the initial process of information scanning and gathering. The collection of input was critical to build the necessary knowledge to base our foresight effort on. We did this by writing a review of the extant literature to learn as much as possible from the available shared knowledge. The first steps did not have a precise direction but rather we followed our research scope, started understanding some of the dynamics of the fashion industry. To better comprehend the language of this industry, it was fundamental to initially consult the main magazines of this sector. We consulted some of the top 5 global magazines, such as Vogue, Elle, and Business of Fashion, and some for the Italian market, such as the online magazine Fashion Magazine, for a total number of about 50 magazines reviewed. In this first step, we have also taken into consideration the annual reports of the biggest players in the sector to realize the size of the forces at play and give us an idea of the direction in which the leaders of the industry are moving. We analyzed the annual reports of the last 4 years of the top 7 companies for global market value and the top 3 Italian companies for a total of 40 reports analyzed. To complete our view, we have taken into consideration industry reports published by consultancy companies or fashion-related organizations, respectively about 20 and 5, in which among the most famous and complete we certainly found *State of Fashion* published by McKinsey and Business of Fashion, as well as the *Pulse of the Fashion Industry* published by Boston Consulting Group et Al. In parallel to this, we could not help but inquire about the Covid-19 phenomenon and its impacts. In this phase, we considered both its impacts on the global economy, with 16 reports, 8 papers and 30 sites consulted, and particularly the effects that the pandemic had on the fashion industry, with 12 reports, 7 papers and 15 viewed. Moreover, in this phase, it was very useful to periodically check some websites as well as the main newspapers, to have access to the most updated data on the phenomenon. The websites we constantly monitored were about 10, such as BBC News, New York Times, and the International. Since our thesis has a future-oriented perspective, the following step was to focus on those who surely will be actors of the future, the youngest generation. We took into consideration Millennials and Gen Z, since, due to the extremely young age no information is already shared about Gen Alpha.

We considered 12 reports, 8 papers and 30 websites among which the most famous ones are those of *We Are Social* and *Porter Novelli*, which analyze in detail the interests and behaviors of young people. In addition, given the confidence of these young people with social media, we also went into detail about some of the dynamics of this sector, considering information through reports and websites of the main social media, respectively 4 reports and 12 sites. Some paramount trends emerged from this collection and preliminary analysis of sources of information, such as urgency of sustainability and social justice. We researched more about these extremely complex topics, trying to widen as much as possible our perspective, considering environmental, social, cultural, and economic sustainability. For the first two, it was helpful to look at the websites of government agencies (12 sites), press releases issued (14) and their reports (8), to understand the policies and laws in place to try and combat these issues. Numerous reports are available on these topics, for example from no-profit organization (18 reports), university publications (12 papers), consultancy companies (14 reports) and generally sectorial players (22 reports). Many sustainability reports are available online, for a matter of easiness of sharing, and we have considered about 11 websites on these topics. As regards cultural sustainability, many websites were used to find recent scandals involving brands and their own websites to understand how they reacted (14 sites) and 4 papers. As for economic sustainability, we mainly resorted to articles that detail the problem (10 articles). At this point, with a wide overview of the themes affecting the landscape of fashion, we went to investigate and consider also other industries that are related and influence the fashion world. First, we saw the growing importance of digital channels, so we went into detail by analyzing the pure digital players, through their websites (12) and their reports (18), to understand what kind of services they offered. Pure digital players put a lot of pressure on fashion incumbents, who have opened a dialogue with them and are rethinking their retail strategies. The retail industry in general is indeed undergoing drastic changes to provide new shopping experiences that combine offline and online channels. Given the importance of the retail network, we also went into detail about this industry, trying to understand how it integrates and what technologies it employs.

45%

SUSTAINABILITY ASSESSMENTS & BEST PRACTICES

26%

FUTURE GENERATIONS CHARACTERISTICS & IMPLICATIONS

24%

TECHNOLOGICAL & BUSINESS MODEL INNOVATION

21%

SHORT & LONG-TERM IMPACTS OF COVID-19

% of inputs that deal with the specified topic, all sources are considered

Specifically, we collected a number of reports and papers of 12. A key aspect for successfully manage these new connections between online and offline is logistics. Therefore, we consulted 18 reports from the main logistics companies. We also went into detail about some specifics such as reverse logistics, with 6 consulted. Finally, we also tried to understand what direction the fashion industry itself was going to, by looking at the most innovative realities. We consulted 8 incubators of start-up websites to try and find some of the most innovative realities, as well as numerous articles available online in specific magazines of the sector, such as *Wired* and *MIT Technologies Review*. This allowed us to identify 30 start-ups with the most interesting projects in: development of new fibers (3); new biodegradable materials (3); smart fibers (1); wearables (3); health-care clothes (4); solutions to support size and personalization (4); circular business models (3); circular design (5); distributed manufacturing (2); virtualization and artificial intelligence (3); tracking technologies (2); sorting and collection (2). Reached this stage of analysis, it has been very useful to observe and gather information from other cultural-intensive industries such as *Cinema* and *Entertainment*, as well as *Figurative Art* and *Design*. This was important because, by nurturing creativity and fostering innovation, these industries maintain cultural diversity and enhance economic performance (Wikipedia). Fashion is also cultural intensive, so analyzing the aforementioned industries allowed us to intercept and anticipate underlying changes in act from the users' perspectives, not in terms of shopping behaviors or daily actions, but rather in deeper cognitive terms.

We studied 20 artists and designers, on their websites and visiting their exhibitions. Cinema and documentaries also were very interesting to analyze, such as the *Social Dilemma (2020)* and *Le Ali della Libertà* (2021), and some other dystopian future series, such as *Black Mirror*, useful to try and stretch our mind when thinking about the future. Parallel to this research analysis, we have leveraged on k knowledge coming from university courses that we have attended, which have been useful in helping us understand how to structure our research work, as well as in providing contents and information. Particularly we consulted 10 courses: Design Strategy and Economics of Innovation, Design Management Lab, Business & Industrial Economics, Economics of Innovation, Management of Design and Innovation Projects, Product Life Cycle Management, Branding & Communication, Leadership & Innovation, Corporate Social Responsibility, Social Innovation. We take the opportunity to thank the professors from Politecnico di Milano, who taught us these courses and helped us in finding the additional materials needed for our work.

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PART II

FORESIGHT

4.

4.1 ANALYSIS

In the Input phase, many sources have been taken into consideration, which differs both in type, subjects, and style. The complexity created by this wide diversity is relevant, and the Analysis phase aimed at taking this large amount of information and trying to structure them more clearly, creating a first sense out of the chaos. This can be done by identifying the major trends and polarizations emerging from data. To describe the trends identified, we can go quickly through the literature review, highlighting those direction of change in values and needs, which are already manifesting within certain groups in our society. What emerged from our research is that Covid-19 in a short period managed to show its tremendous strength, spreading in a few months from China into almost every country, challenging harshly the resilience of human beings. The pandemic has disrupted our world and our paradigms adding uncertainty in an already uncertain world. Indeed, society was and now is even more fueled with tensions and uncertainty for the future. The degree of disruption makes us say that we have entered a post-pandemic era made of new paradigms and artifacts, new patterns and behaviors, new values, and new priorities that are going to become dominant. Indeed, the pandemic has also brought some deep, permanent changes to the lifestyle of especially younger generations, who for the first time, experienced severe constraints to their freedom. Some behaviors disappeared, others strengthened, others remerged. The frequency of consumption behaviors has been changed by the pandemic, reducing particularly discretionary products. This also holds true for fashion, which witnessed a temporary drop in demand, but at the same time a long-lasting shift of preferences towards sustainable products as well as companies adopting circular business models. Particularly, a major trend that has emerged among the youngest generations is the awakening of social consciousness. These generations require a radical shift of business paradigm towards a purpose-driven approach, which means taking a stand and demonstrating commitments with real actions.

People and Fashion industry Trends identified:

1. *SOCIAL TENSIONS AND UNCERTAINTY FOR THE FUTURE ARE ON THE RISE*
2. *PANDEMIC AWAKENED SOCIAL CONSCIOUSNESS ESPECIALLY AMONG THE YOUTH*
3. *ACTIVISM ON CLIMATE CHANGE, ETHNIC INCLUSION, GENDER IDENTIFICATION IS BROUGHT ONLINE*
4. *YOUNGER GENERATIONS SEARCH FOR THE TRUTH BY CROSS-REFERENCING INFORMATION*
5. *COEXISTENCE OF DIGITAL AND PHYSICAL CHANNELS, WITH YOUTH PREFERRING A CLICK-AND-MORTAR MODEL*
6. *SUSTAINABLE FASHION COMPANIES ARE GAINING AN ADVANTAGE IN POST PANDEMIC*
7. *GLOBAL DISTRIBUTION OF VALUE CHAIN AND OVER-RELIANCE ON ASIAN SUPPLIERS IS PROVING TO BE AN INCREASINGLY INEFFICIENT MODEL*
8. *THE FAST-FASHION DOMINANT MODEL IS NOW BOUND TO BE TAKEN OVER*
9. *POLARISATION OF FASHION INDUSTRY INCREASED AFTER THE PANDEMIC WAVE OF M&As*
10. *COVID-19 HAS ACCELERATED THE NEARSHORING OF VALUE CHAIN*
11. *CORPORATE SOCIAL RESPONSIBILITY POLICIES ARE BEING INCREASINGLY ADOPTED*
12. *COLLABORATING WITH PURE DIGITAL PLAYERS IS NOT AN OPTION ANYMORE*
13. *DIGITALIZATION OF PROCESSES AND WHOLE VALUE CHAIN IS MOVING FASHION TOWARDS AN INDUSTRY 4.0 PARADIGM*

They do not take for true what companies tell but being a digitally native generation, they are very comfortable with collecting and cross-referencing sources of information. This search for truth is a key characteristic of these generations. To cope with this, companies from almost any industry have already begun to disclose additional information to the public, adopting Corporate Social Responsibility policies. Moreover, youth are very conscious about what happens every day in our world and do not sit on the sidelines. They are a generation of activists, and they bring this activism where they are most comfortable, online. Social media have become organizers for those battles that are closest to the heart of these generations: climate change, ethnic inclusion, gender identification, are taking people to the streets to shout out loud their request for changes. Digital channels offer wide opportunities to meet not only these next generations but also the older ones, since the pandemic had a catalytic effect on digital literacy, especially among the most disadvantaged with technology. Companies then must design new user journeys that consistently integrate online and offline experiences, taking into consideration though that the youth prefer to convert their purchases into physical stores. This model is known as click-and-mortar. Digital channels also bring a major risk, that is the over-provision of alternatives. An increasing number of retail brands are today available and offer too many options to the point that it becomes difficult to gain loyalty from the youngest generations. Though the Covid pandemic not only brought changes in consumers' behaviors and lifestyles, it also hastened some dynamics of the fashion industry. During the pandemic period, the polarization increased through a wave merge and acquisitions made by the biggest companies, which took advantage of the downward evaluations of many firms under financial distress. Another trend that was already underway and witnessed a relevant explosion during this pandemic period, is the coexistence and relative power of digital and physical channels. Once the emergency period is over, the relevance gained by digital channels will persist, and this is an opportunity for companies to invest in digital channels and rethink their network of physical stores. Nonetheless, investing in owned online channels is not enough but the incumbents must deal with those pure digital players, who are increasingly becoming the entry point of the fashion user journey, thanks to the high level of service offered.

Although the Covid-19 pandemic has created interesting opportunities to exploit digital channels, it has also made manifest some inner weaknesses of the actual organization of the fashion value chain. The initial shutdowns of China and more generally Asian countries caused most companies to suffer from supply shortages; the global distribution of value chain combined with the over-reliance on Asian players for the supply, has then proved to be highly inefficient. Fashion companies have paid dearly for this crisis from the economic point of view, though the real victims, those who have suffered the worst consequences, have certainly been the least considered of the supply chain: workers from the early stages of production. Indeed, western brands have canceled huge quantities of orders, leaving eastern manufacturers with liquidity shortages and difficulties in paying employees. Delocalization of early stages of the value chain has been a major trend of the last decades, driven by a deep change in business model, with the emergence of fast-fashion. This caused a tremendous worsening of the fashion performance in terms of sustainability, from the environmental, social, and cultural perspectives. The pandemic once more showed the environmental inefficiencies of our economic system and fashion is no exception; combining this with the resurgence of social consciousness, the fast-fashion dominant model is now bound to be taken over. An immediate effect is that Covid-19 has accelerated the nearshoring of the value chain, which means bringing production in countries closer to the final markets, enhancing both flexibility and resilience of the fashion system. To try and reduce as much as possible the gap with labor costs of the Asian countries, companies have been investing heavily in automation and are moving towards an Industry 4.0 paradigm. This digitalization of processes and the whole value chain will help also develop a demand-driven value chain, which could reduce the inefficiencies of the actual system. With these few lines, we tried to summarize key findings of our thorough research, adopting trends as a way of expressing major directions of change. Hereby, the most important trends are shown in a concise way to favor an immediate understanding of the contextual revolution brought about by the pandemic. Since our thesis has a strong user-centered approach, the trends identified and discussed above were elaborated along with the wider inputs gathered to identify the dominant post-pandemic feelings, which will drive people evolution.

DOMINANT SENTIMENT 1

The root cause of loneliness is shelter-in-place orders, which during the pandemic forced us to isolate from the outside world. Several behaviors have been adopted to cope with loneliness and some have become habits. Even after the pandemic, loneliness is expected to become one of the dominant psychological states, since on one hand we got more used to staying alone, and on the other hand, several activities have been reshaped permanently in a more isolated way of doing. Remote working, food delivery, e-commerce, are all examples of activities once social and convivial moments that have become more solitary. Digital tools for example helped overcome the place rigidity and enjoy social moments. Though, a vicious cycle may exist between using digital channels and increased loneliness. Loneliness can be experienced differently, for example someone might only experience slight discomfort in highly social contexts. This sentiment is then part of a polarization since it can manifest itself with different levels of intensity. At one pole we find the extreme influence of loneliness in complete isolation, which consists of relocating any social interaction within the digital world. At the opposite pole instead, we find the deep sense of belonging and identification in a community. Between these two extremes, there is a continuum of shades that represent what every one of us will feel. A middle ground lays in the awareness of one's impact on other people and a wider community. Indeed, we have come out from this experience profoundly transformed, especially in terms of individual awareness of daily and social life as well as consumption behaviors.

Fig. 121 – Degrees of polarization of Loneliness

"Loneliness is expected to prevail in the post-pandemic" - Wang, X.; Wong, Y.D.; Yuen, K.F., 2021

DOMINANT SENTIMENT 2

shame

Climate change is currently perceivable every day and we are getting aware that our own actions play a role. Lockdown periods made us visualize the gravity of this problem: people in some areas of China could see the blue sky after years, water in Venice canals was limpid again. While we were stuck at home, our Earth could breathe. Particularly, the younger generation experiences anxiety about their future perspectives, which is accompanied by a sense of shame for their lifestyles that are perceived as not healthy and not environmentally friendly enough. As a matter of fact, our daily human activities are causing most negative impacts to our planet, and this is what determines the feeling of shame and inappropriateness of our daily habits. Who is to blame for all this then? Big corporations, governments should undergo major changes and lead by example, but we also need to take seriously into consideration the individual dimension. This sentiment of shame can also be described as a polarization. The first extreme is a deep sense of shame, meaning the people feel guilty and decide to alleviate this sentiment, they need to change their daily behaviors. At the opposite extreme instead, we find people that do not feel ashamed of all for their behaviors, since they have already undergone changes in daily lives or are committed to other social or environmental causes that, in a way, offset the negative impacts. Between these two extremes, a slight sense of shame arises, since it is impossible to not feeling part of the environmental problem, though this degree of sentiment does not have a very transformative power.

Fig. 122 – Degrees of polarization of Shame

"A sense of shame about living lifestyles that are perceived as not healthy and environmentally friendly" - Hassim, A., 2021

DOMINANT SENTIMENT 3

Digital tools have disrupted the way people get informed, making easier and almost costless accessing news and information. The pandemic period acted as a catalyst of this process, increasing digital literacy, and consequently reducing information inequalities. With place rigidity, people found more time and new involvement in social issues, looking for news, cross-referencing sources, reflecting deeper on the society we live in and its dynamics. Nowadays, it is hard to turn a blindside to the inequalities of our society. Media continuously show us bad news, social media especially display the harsher reality. Unlike years ago, it is impossible to renege that social, environmental, financial, gender, ethnic inequalities are getting worse. This perception of inequity results in a feeling of resentment and profound indignation. People not only are becoming more aware of these problems, but they are also shifting attitude. Again, we can better understand this sentiment by resorting to a polarization. The first extreme denotes an active approach towards society inequities, distinguishing those who are ready to raise their voice and fight. Especially young people indeed believe to have the power to change the world, taking a stand, raising their voices, both digitally and physically, and demanding concrete and coordinated actions towards a fair, and equitable future. On the other extreme, the approach to society inequities is passive, which does not mean denial, but not being ready to make a personal fight. With an intermediate degree of resentment, people have a reactive approach, being shaken by these issues, but acting only partially to fight for these themes, or probably identifying among the issues, those most intimate to the individual.

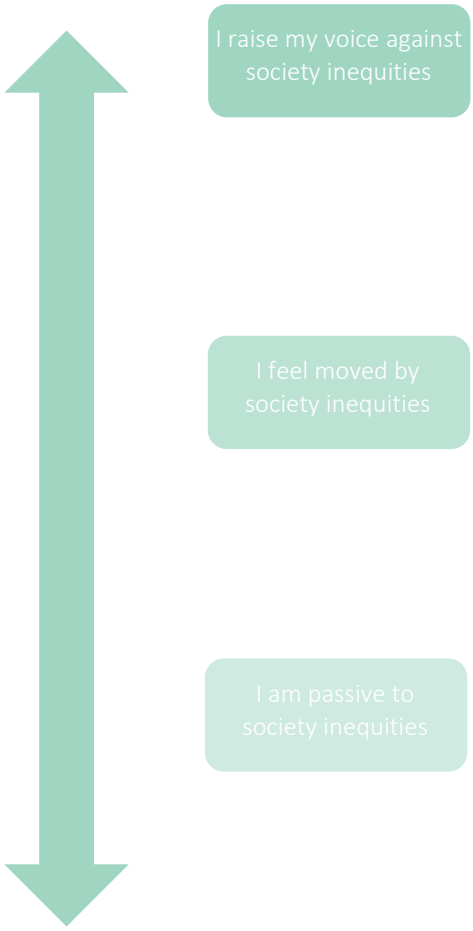


Fig. 123 – Degrees of polarization of Resentment

"Resentment is also another keyword to describe the younger generation, a generation that does not stay on the sidelines but is ready to act and improve the world" – Parker, K. & Igielnik, R., 2020

4.2 INTERPRETATION

If in the analysis phase the aim was to give a first sense to the inputs collected, in the interpretation phase we moved deeper in understanding data, with the aim of finding insightful information that would help elaborate future foresights. Following the user-centered approach, we started by elaborating on the three dominant sentiments previously identified, *loneliness*, *shame,* and *resentment*. Indeed, these are not mutually exclusive, but rather they coexist within all of us. None is actually dominant over the others, but they create inner tensions, by clashing each other. As a result, our attitude towards life, work, society, and planet, is shaped. We expect three main attitudes to arise in the post-pandemic era, which are based on the polarizations previously identified. Indeed, along with the definition of the sentiment, we have also listed three degrees of intensity each, meaning that all of us may experience differently the same sentiment. Combining then possible intersections of relative weights of each sentiment, we were able to define three post-pandemic user attitudes that according to us, are already partially visible in the outside world.

Isolation is the first attitude identified, which sees as a dominant sentiment loneliness, with a relevant contribution of shame; resentment is at its minimum, with a passive attitude towards society inequities. This is an attitude of self-immersion, which makes people partially lose the communitarian vision of our society.

Responsibility is the second attitude, coming from a dominance of shame, which cause people to take responsibility of one's own actions; they do not feel alone, but are especially aware of the impact they have on others. Additionally, a reactive approach to society inequities makes them drive choices especially in purchasing.

Finally, *Criticism* is an attitude dominated by resentment and willingness to raise the voice and protest the status quo, to fight for society inequities, which is linked to the deep sense of community belonging and definitely detach from being ashamed for individual actions.

Fig. 124 – Post-pandemic attitudes

This page shows the combination of different degrees of the three polarities, which bring to life the three attitudes previously introduced. This is to clarify that the sentiments are not standalone, but rather interact and drive people behaviors and attitude to life.

Fig. 125 - Sentiment Polarizations are combined to identify a first attitude of Isolation

Fig. 126 - Sentiment Polarizations are combined to identify a second attitude of Responsibility

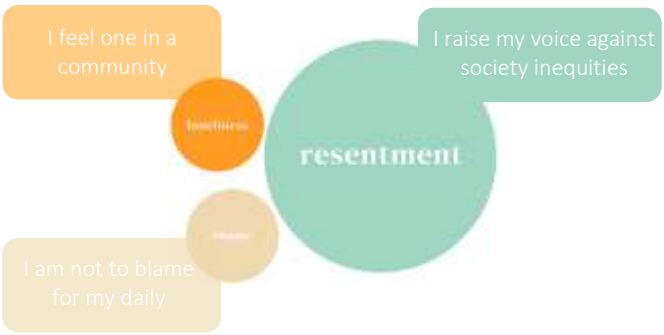


Fig. 127 - Sentiment Polarizations are combined to identify a third attitude of Criticism

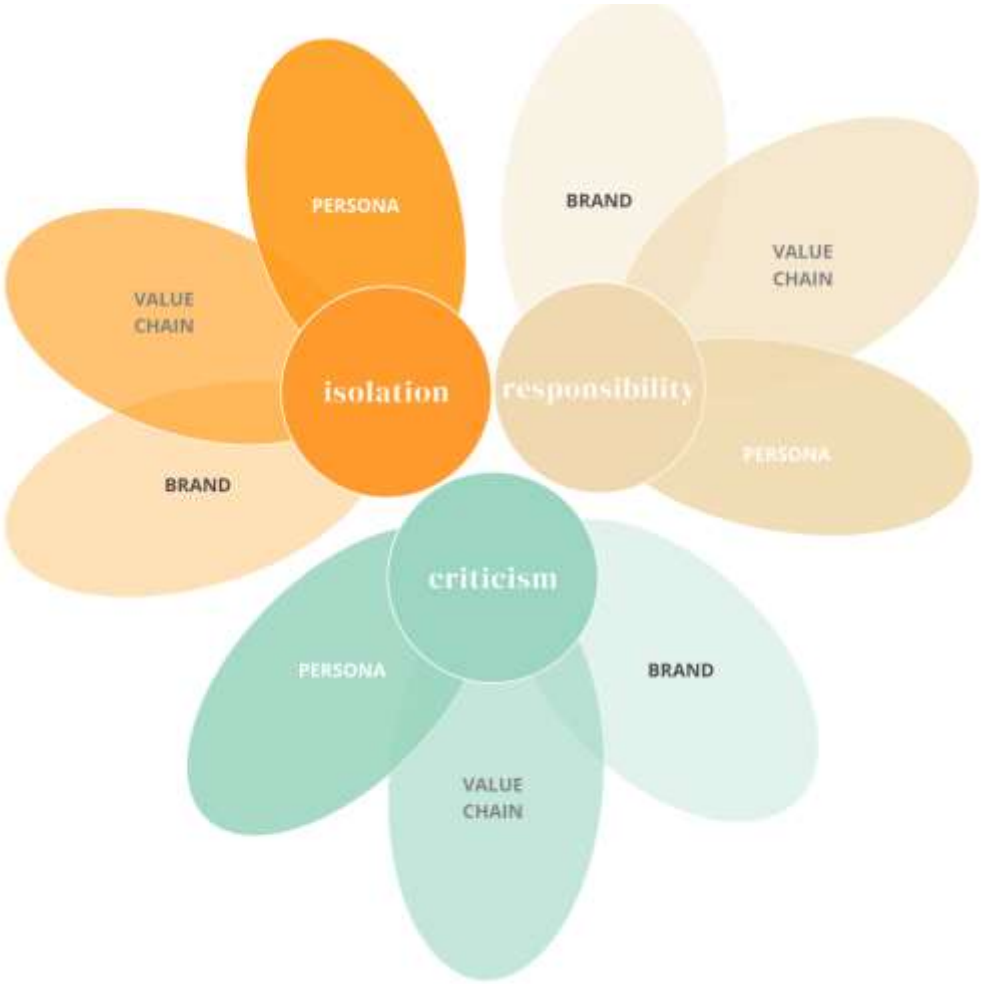


Fig. 128 – Representation of the Kernel. Source: Author elaboration

This first interpretation on data focused only on people because our aim was to elaborate user-experience based scenario. This means that the foresights were driven by people evolution which, in our case, is represented by the three attitudes just explained. All the inputs considered in our research have become then the tools to interpret this evolution of people and to design accordingly scenarios which also encompass fashion value chains and brands. Practically speaking, from the very beginning of our research we extrapolated signals from the sources of inputs. Meaning that we collected all the thought-provoking data and information that seemed to open perspectives on future worlds. Signals are indeed examples that anticipate future; with the right mindset, data offer a wide range of interpretations of future development. Though, the process of signals identification is not the real hurdle.

The most complex phase is to make a collective sense of signals, meaning that we need at first to identify the right clusters of signals and then to interpret them properly. In this way, it is not the single signal that brighten an intuition on future, since in this case it would be highly subjective and almost anyone could have a different intuition. Through the combination of the right signals instead, we can elaborate comprehensive and meaningful drivers of change that usually have a much clearer impact on current dynamics and variables, detaching from a merely subjective interpretation and adopting a more agreeable identification of a possible evolution. Several mapping attempts have been performed to make sense of the variety of data collected, adopting different logic as we progressed in understanding our data. In the following pages we are going to present the last elaboration made: the *kernel*.

This name has a double meaning; on one hand, it is to represent the centrality of this map within our foresight process, since it poses the basis for identifying all those key characteristics that have converged into the scenarios. On the other hand, this name wants to communicate that it is only the core part of our mapping efforts; indeed, we decided to include in our dossier only the minimum set of those most meaningful signals that enable a full understanding of the foresights, for matter of space and brevity we could not include all the signals that have been taken into consideration. Fig.128 shows only the configuration of our kernel, to show the logic behind it. We firstly posed at the very center the three attitudes elaborated. Then, signal have been positioned around these three attitudes and clustered according to three scopes. *Persona* includes those signals that were leveraged on to build the attitudes but enlarges the perspective considering also purchasing processes and particularly relationships with fashion products. *Value chain* cluster focuses on the major transformation at the system level that are happening or are needed to answer the new attitude from users. Finally, *brand* cluster considers the evolution of design, retail, and value generation according to the new attitude emerging. This process allowed us to pose the basis for scenarios that were user-experience based consistent with the emerging different attitudes, which identify possible evolution of people. At the same time, the scenarios elaborated were comprehensive of the scopes that are needed to make a valuable contribution to fashion industry. The following pages show a zoomed view of the kernel isolating the three directions of change identified. Additionally, drivers of change are shown that help synthetize the main transformations that scenarios realize.

DRIVERS OF CHANGE

PERSONA

From wandering lonely in the digital
To always feeling digitally connected

VALUE CHAIN

From a physically polarized supply chain
To a virtually concentrated system

BRAND

From differentiating for products features
To differentiating for knowing the customer

VALUE CHAIN

-35% TTM

Pandemic fostered conversion to digital channels of B2B transactions, whose main advantage is to reduce Time To Market through: shortening sell-in period, avoiding physical trade shows and travels, reaching smaller customers, even adopting segmentation-of-one strategies (6)

INDUSTRY POLARIZATIONS IS TRANSFERRED VIRTUALLY

BRAND

163 ZB

zettabytes of data will be available globally by 2025 (1 zettabyte = 1 trillion GB) (14)

AI IMPROVES CUSTOMERS KNOWLEDGE

+10 / 30%

revenues improvement thanks to reccomendation and next best offers (15)

Synflux

Fashion lab creating in-house technologies, leveraging on AI and digital fabrication, to create the fashion of the next generation, blending sustainability and digital (16)

PERSONA

67%
thinks there is too much choice online due to large variety of alternative (1)

ONLINE SHOPPING IS ALREADY OVERSUPPLIED

8"
is the time for a brand to be out of mind (1)

Gen Z saying that their purchases of particular categories are most affected by social media (1)

56% Fashion
42% Technology
31% Travel

FEDERICO CLAPIS
Crypto connection, 2018
Denounces the detachment from reality we are living due to digital technologies and the premature adoption of digital technologies (2)

People who did not purchase fashion items online before the crisis have started using online

4,5 h/day
time spent by Gen Z on social media (4)

DIGITAL IS AN ALTERNATIVE TO REAL WORLD

64%
Gen Z says they are constantly connected online (5)

Top 20%
of fashion companies contributes to more than:

200%
of overall value generated (7)

Meta

Facebook announced on 28th october the release of Meta, the first metaverse to include both social interactions and shopping experience (8)

90%
Fashion industry sales are seized by European and North American based companies (9)

VIRTUALIZATION OF EXPERIENCES

Fashion shows are a pain point for the fashion industry both for unsustainability of these events and huge investments needed. Virtual formats that often break the timing of traditional fashion calendar is an increasing response (10)

BEEPLE
Everydays: the first 5000 days, 2021
Most Expensive crypto artwork by Beeple, was bought for $ 69 mln. Cryptoart is already an established current with a market capitalization of more than $ 1 trillion (11)

VIRTUALIZATION OF VALUE

FABIN RASHEED
"True Creativity happens when such an AI engine works together with a human being, thus assisting and augmenting the human. It's a play, or a dance between the AI and the artist" (12)

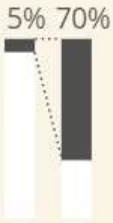
$ 190
billions is the value of solely digital dress by 2025 (13)

isolation

BRAND

Eileen Fisher takes back clothes, over 1,6 million pieces since 2009, that are resold or remanufactured into new one-of-a-kind designs. Durability of materials and design strategy are essential to guarantee feasibility of these operations (32)

LIFECYCLE THINKING ENABLES CIRCULARITY



HNST jeans are designed to to ensure that the entire item can be efficiently processed in one and the same recycling stream. They use 100% natural fabrics, reusable buttons and no polyester labels but printed information on the fabric (33)

Actual costs of design phase are limited but influence the subsequent environmental costs (25)

Filippa K, distinguishes garments based on their speed of lifecycle. Garments with a slow cycle are made with 100% recycle materials, timeless design and high durability. Garments with fast cycle are made with biodegradable materials and natural dyes (34)

ETHICAL SOURCING AND PRODUCTION

France introduced Extended Producer Responsibility rules for textiles in 2008, and in Sweden the government is working towards implementing EPR for textiles by 2025 (28)

Most important nearshore market by 2025 for respectively European and North American companies. Nearshoring improves flexibility and resilience of value chain and reduce iimpacts of logistics (35)

$51 bln

value of recommerce global market by 2023, with projected growth rate of + 16% (29)

COOPERATION IS KEY TO INNOVATE THE INDUSTRY

60%

fashion retailers say partnering with an existing resale business is the best approach to get into resale (19)

E.M.F. partnered with over 60 companies to develop a closed loop production cycle for jeans, being them a relevant portion of fashion clothes consumption (31)

Fashion industry is suffering from lack of common language and industry-wide alignment on circularity and sustainability because of the complexity and variety of topics related. A common language is needed to enable radical innovations of processes and business models. (25)

Guerra de la Paz is a collaboration between Alain Guerra and Neraldo de la Paz who, over the past two decades, have transformed the castoffs from our collective wardrobe into poetic works that deliver powerful political and environmental messages (24)

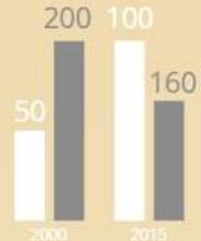
CHASING WASTE IS THE STARTING POINT

responsibility

$460 bln

annual cost of thrown garments that could still be worn (21)

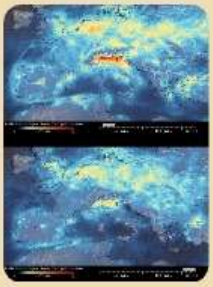
CHANGE STARTS BY DAILY BEHAVIOURS



bln fashion items sold

number of usage per fashion item (21)

"The decline in nitrogen dioxide concentrations over the Po Valley in northern Italy is particularly evident ... coincides with the lockdown in Italy causing less traffic and industrial activities."
Claus Zehner, ESA, (23)



Geo Z after the pandemic, have made significant lifestyle changes to lessen environmental impact and have started to go out of their way to recycle (22)

75%
Apparel and Footwear Value Chain GHG Emissions in 2018 were caused by upstream activities (30)

VALUE CHAIN

> 15 000
types of chemical additives (28)

44 trn
liters of water used annually (28)

SMALL RECYCLING LOOPS ARE MORE BENEFICIAL

22%
of mixed waste are attributable to textile (26)

< 1%
fiber input from closed-loop recycling (21)

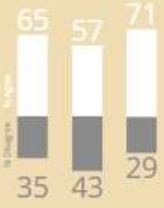
Purchase is pathological when it becomes addiction,and impulsive, which opposes to desiring something. It is then an "*ill expression of an interior suffering*", it is a cultural, economic and therefore political and social problem.
Ugo Zamburru psichiatra, (res. Dahu)
- Le All non sono in vendita (20)

VALUE IS NOT PURCHASING *NEW* PRODUCTS

PERSONA

53%
Gen Z will spend more on second hand in the next 5 years (19)

1 in 2
Consumers care more about seeking value than before the pandemic (18)



After the pandemic, Gen Z will buy more durable fashion items, will repair them rather than buy new ones and will throw out less often (18)

DRIVERS OF CHANGE

BRAND

From continuously offer new products to continuously revalue the narrative behind a garment

VALUE CHAIN

From a waste generator system to an endlessly circular ecosystem

PERSONA

From being ashamed for individual actions to care proudly of behavioural changes

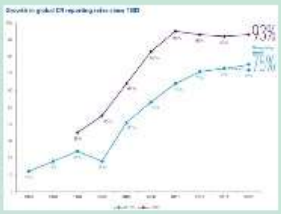
criticism

Cultural contamination too often results in exoticizing, stereotyping and improper recontextualization. In photo traditional Huipil by Mixe Community and Isabela Marant SS 2015 Etolie Line Collection (38)

First ever use of blockcahin. Each dress has a unique digital token with which is possible to create a digital history of the garment which is presented to user via an interface they can access through their item's QR code or NFC-enabled (39)

TRANSPARENCY

Transparency Index by (40)



Corporate Responsibility appearances in reporting from top 100 companies per revenues from 49 countries (N100), and world top 250 companies per revenuees (41)

(42)

Banksi
Profit over people, 2012
The red arrow represents profit, driving away a group of children, old people and a black woman holding a small child.

REPURPOSING BUSINESS

9/10
Gen Z believes that companies have a responsibility to address environmental and social issues

75%
Gen Z will do research to see if a company is walking the talk when it takes a stand on an issue. (46).

83%
feel that they can personally make a difference (46)

88%
feel their generation has the power to transform the world for the better (47)

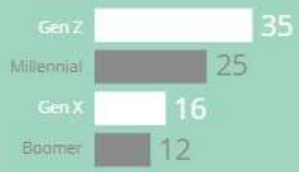
40 mln
People working in modern slavery conditions many of whom are in Global South, working in the supply chains of Western clothing brands (43)

WORK DIGNITY / WORKHISM / WORKERS RIGHTS

The fashion industry is subject to very serious problems of minor labour, minimum wage, and working conditions often referred to as "*modern slavery*". Several dramatic scandals happened such as the Rana Plaza building collapse, which caused more than 1100 deaths and thousand of injured (43)

27,6 mln
posts on Instagram with #blacklivesmatter Social Media are extremely effective in creating grassroots movements (48)

REDEFINING THE SOCIETY



% saying they personally know someone who prefers that others refer to them using gender-neutral pronouns (45)

Change of museums, from insitution tocollection, to civic spaces (49)

87%
Gen Z are encouraged when they see their peers take a stand on issues (47)

PERSONA

Gucci after the accusations of racism for his balaclav a jumper has appointed a diversity officer (36) Source: Ong, 2019

BRAND

REPRESENTING A CULTURE

Malefatte Venezia involves inmates in working activities that could result in hiring afte the detention period is over (37)

7,7%

percentage of the upfront price that goes to workers (43)

REDUCE GLOBAL SUPPLY UNBALANCE

60%

China's share of the fiber, yarn, and fabric production stages (44)

VALUE CHAIN

DRIVERS OF CHANGE

BRAND

From harnessing cultures and workforce
To representing people culture and labour

VALUE CHAIN

From a global distributed hard to control supply chain
To a regional and fully transparent value chain

PERSONA

From feeling resentful for world inequities
To actively redefining society and business

4.3 PROSPECTION

The interpretation phase is probably the most critical phase, since the poses the basis for a consistent foresight effort, which instead realized concretely in the prospection phase. In this phase we elaborated concretely three alternative scenarios, based on our kernel: *Digital Immersion*, Endless *Caring* and *Fashion Activism*.

Combining indeed attitudes, signals, and drivers of change, we had all the tools necessary to envision the scenarios. They have been initially represented through a sketched and blurred vision, encompassing the three scope of our work but with a rough level of detail. We progressively went deeper adding also the insights coming from signals previously excluded or searching brand new signals that were more consistent with the scenario formation. The phases of interpretation, particularly the kernel mapping, and prospection were performed in a highly iterative way. To enable an immersive experience within scenarios, we separated them from this chapter, but only for a matter of page formatting, whereas from the conceptual point of view, scenarios are part of this prospection phase.

Each scenario opens with an abstract where the main features of the scenario are briefly described. This first section also presents the three main signals of the scenario, divided into persona, value chain, and brand, and some of the keywords that identify it, to convey some initial feelings of the new vision. Subsequently, the persona that dominates this scenario is presented, who embodies the attitude enabling the whole scenario. The attitude indeed influences actions made by the persona in this new reality and particularly, as regards fashion a user journey is shown. This journey details how the persona meets the brand, their purchasing experience, and their interaction with fashion products. Then the scope of the scenario is widened with a paragraph "transforming the world", where it is explained how the world has evolved to respond to the different trends that have become dominant according to the different scenarios, taking into account, for example, the technologies that have emerged or how professional figures are evolving. Then the new value chain is introduced, explaining the main transformations undergone to adapt to the new world and persona, trying to understand particularly how the relationships between the various players have evolved. Subsequently, the scope is narrowed down to the dimension of the brand, where the new ways in which it relates to the users are analyzed as well as design and supply choices. Finally, all scenarios conclude with a sustainability assessment, which considers the four categories of sustainability (environmental, social, cultural, and economic) to give a first qualitative assessment of each scenario.

PART II

SCENARIO 1: DIGITAL IMMERSION

5.

5.1. ABSTRACT

The first is a scenario in which the digital pervades every aspect of reality, in which everything is or can be done in a virtual world. The fascination and the opportunities of the digital find consensus particularly among a new personality that has become common in this reality: the Introvert.
Introverts have found a way to cope with their dominant sentiment of loneliness, taking refuge in these digital worlds. It is a real digital immersion, which has led them to almost alienate from the real world, considering the virtual a more attractive place than the real world. In the digital worlds, there is room for every kind of desire and need they have, from education to sports to work. Social media have been the first to evolve towards a more immersive reality thanks to the creation of a parallel reality, the metaverse, which has become a new frontier of communication and has opened new spaces for sociality. Thanks to the use of avatars, people can move through the metaverse as if they were in the real world. They can meet new friends, take a walk, and can even make purchases for their avatars, such as clothes. Shopping is transformed and transferred in the virtual reality. With the avatars, it is possible to access metaverse malls, personalized according to huge amount of data defining user's preferences. The shopping experience is transformed into a truly immersive experience. The continuous digital interactions, help the brand to easily access data, which allows knowing more and more in details users. This allows brand to deploy a segmentation of one strategy. This reality witnesses a strong reduction of production volumes, since fashion is transferred in the virtual reality, and the factories still operating exploit an Industry 4.0 paradigm with a high level of automation..

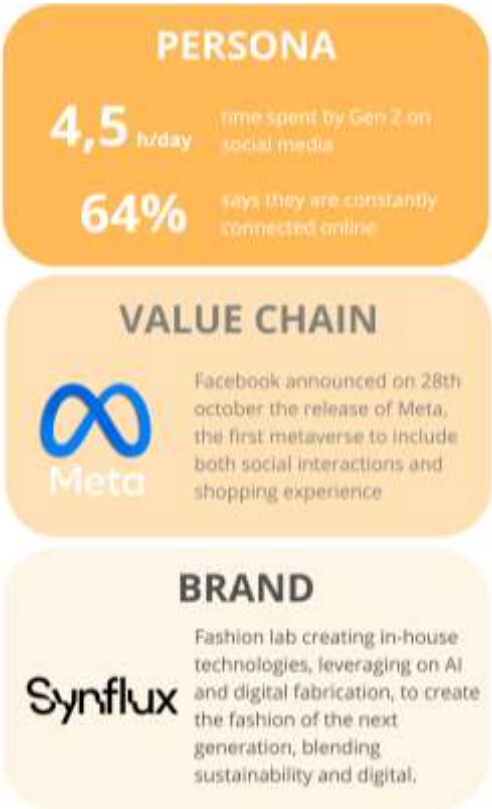


Fig. 132 – Top signals Digital Immersion scenario

KEYWORDS: Metaverse, Virtualization, Data, Artificial Intelligence, Home, Isolation

5.2. THE INTROVERT

The introverts are personas driven by an attitude of isolation: post-pandemic loneliness has pervaded their lives, but they managed to cope with it. Working from home, practicing sports at home, delivery of groceries are just a few examples of the activities that have become habits. Thanks to digital solutions they have found a way to cope with loneliness, not to fight it. These solutions are seen not only as a way to facilitate life but also to substitute physical interactions. Indeed, once the pandemic restrictions were over, they felt quite rusty in physical social contexts, whereas more comfortable in expressing themselves through digital channels, and this attitude is going to last long. They do not feel the necessity of owning products physically, on the contrary look for corresponding services on demand. They are surely well informed and comfortable in cross-referencing sources of information. They feel among the responsible for the planetary crisis, especially since digitalization has begun to show its real environmental costs. A sense of shame makes them willing to experiment with new alternative behaviors since it does not require an extreme effort. Their attitude is passive; they do not take a stand for social causes unless it is just a click away. They value above all immersive, unique, and tailored experiences; they want to match digital easiness with sustainability.

		Where	What	Feeling
Trigger		The Introvert Home	The Introvert receives a notification on the smartwatch about V-Dress fashion show that is about to begin in few minutes. Wears VR equipment and selects the event to attend.	Jaded
Immersion		V-Dress Fashion Show	The Introvert enjoys the avatars walking and appreciates the new collection of virtual dresses proposed by the brand.	Amused
Discovery		Metaverse Mall	Decides to go shopping and accesses the most famous mall in the metaverse. Stores are ordered according to user's preferences and the first encountered is V-Dress store.	Spellbound
Interaction		V-Dress Store	Entering the store means entering a unique world, immersing in the values and beliefs of a brand. A virtual shopping assistant exhibits the new collection, explains the ideas behind the products and shows the possible personalisations.	Engaged
Purchase		V-Dress Store	The Introvert pays for the virtual dress with digital currencies and receives a non-fungible token that certifies the originality. The virtual dress is automatically added to the personal wardrobe and ready to be worn.	Eager
Amusement		Rino's Cafeteria	Meets a friend at their favorite cafeteria for lunch, wearing the new virtual dress just bought. Talks about the V-Dress in-store experience while the friend can easily access information about the dress and interact directly with V-Dress.	Thrilled

Fig. 133 – User journey Scenario 1 Digital Immersion

5.3. TRASFORMING THE WORLD

The first is a scenario where digital pervades every aspect of reality where, thanks to the emergence of a VR-enabled Metaverse, everything can be done in a virtual world. The current behavior of spending time online becomes an established habit, whether for work and educational activities as well as for recreational activities, such as playing sports or doing shopping. Social media evolves towards a more immersive reality thus replacing social spaces. Thanks to the use of avatars, people can move through these social as if it were the real world, hanging out with friends or meeting new people. The winners in this virtualized reality are the big tech companies. There are quite a few big players competing to acquire a dominant position. As a result, we may see several versions of the Metaverse appear. For a more effective solution, the big players may come together to build a unified platform that they all can operate on. These companies have an expanded portfolio of products and services, both B2B and B2C; for example, payment services, based on cryptocurrency, which has almost replaced traditional money, making it less necessary to have centralized systems of control.

The resources available to these companies are immense, greater even than those of the majority of States, which are forced to have a continuous dialogue and compromise with them. In this new, highly digitized world, ownership of a physical product becomes unnecessary. This leads to a strong reduction of production volumes for a large number of products. Those companies still manufacturing physical products, are based on the Industry 4.0 model. This paradigm consist of highly automated systems and skilled employees, expert in areas such as AI, robotics engineering, and algorithm programming. The value chain is connected through sophisticated data systems that can leverage the amount of data that are continuously generated online and can become valuable sources of competitive advantages. Some of the activities like design, architecture, or engineering run on Artificial Intelligence with limited human inputs. AI-based systems propose the best designs for new virtual products based on customer requirements, key performance indicators, and crowdsourced ideas. Moreover, country borders play a diminished role in a virtual world and fading local identities encourage the establishment of global design standards.

Despite the digital immersion enables people to live detached from reality still there is a rising concern about people and planet safety. On one hand, hacker attacks have intensified, and as a society that is totally dependent on digital, their impacts have also become more severe. On the other hand, after the initial excitement around the digital conversion effectiveness in reducing environmental impacts of human activities, the hidden costs of digital are becoming more evident. For these reasons, governments and private companies funnel enormous resources into cybersecurity and process optimization.

5.4. VALUE CHAIN

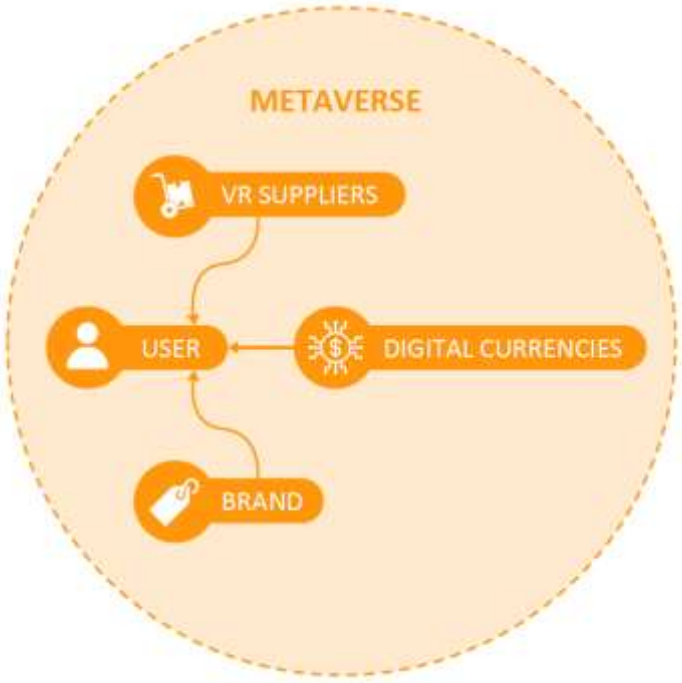


Fig.134 – Value chain Scenario 1, Digital Immersion

The metaverse is a virtual replica of the real world but without the spatial limitations of the physical one. People can move freely in this world, they can "travel" from one part of the globe to another. In the morning they can study at the Massachusetts Institute of Technology, in the afternoon surf the waves of Portugal and in the evening go out and meet friends from all over the world. The metaverse provider is the main enabler of this new reality. In fact, the metaverse can exist only thanks to the services offered by the few big tech companies that rule the metaverse world.

These services can be accessed through to VR technologies that guarantee an immersive experience of the metaverse. Since this tool is indispensable for the service, often it is the Metaverse providers themselves who own or acquire the producer of VR technologies. Among the many activities, they can enjoy is shopping, which is organized in metaverse malls. Unlike traditional malls, these virtual malls adapt to each customer who enters them. For example, changing the colors and lights depending on how the mood of the customer is perceived at that moment, or the order in which the stores are presented is different depending on the user. The first to be visible to the customer are those that are more relevant to him, for example, because he has already been a customer or because the analysis of customer data between user and brand reveals a compatibility. Once inside a store, the customer enters a totally immersive reality and is personally followed by a virtual assistant, who has a wide knowledge of the tastes, preferences, and purchase record of the customer, and who guides and recommends the most suitable products for him. The Metaverse is then the main touchpoint between users and companies. Fashion brands can personalize virtual stores within the metaverse and can access additional services such as product portfolio management, marketing analysis and user profiling. Apart from retail activities, users come into contact with the brand thanks to some of the many experiences that can be enjoyed in these parallel worlds, such as participating in events or attending virtual fashion shows. This is a reality where any interaction is recorded and the flow of data between users and companies is continuous. For this reason, companies have structured themselves to try to better manage this huge amount of data, and thanks to the use of artificial intelligence, brands can know what the user's tastes are and offer the right product and services. The designs proposed by brands are often made by technologies such as Artificial Intelligence. Once the customer has chosen the product, it can be purchased with one of the many digital currencies available.

5.5. BRAND

As soon as the avatar enters the "doors" of the virtual store, user immerses in a totally different shopping experience from the traditional one. There are not simply exposed products that can be purchased, but user gets immersed in the storytelling of the brand, which can communicate its values in a very visual and engaging way. We can imagine for example an Italian brand: entering the store the user finds himself wandering through the typical alleys of a Tuscan village, talking and interacting with the local people and appreciating a glance of a far in distance country. Moreover virtual stores can be used to raise user awareness around certain issues and brand commitments. By promoting a more engaging experience, the user feels more involved in these issues and is made more conscious of them. Virtual assistant guides user levereging on a deep understanding of ondividual tastes.

In this way the vastity of choices is reduced and user can easily select the most suitable digital dress. The digital clothes can be tried on by the avatar and can be customized in every aspect, to create unique design. Moreover, different contexts of use can be simulated to understand how they look like in the different situations of use. Once the purchase is done with a cryptocurrency, together with the digital dress, user receives a Non-Fungible-Token, which attests to the originality of the product purchased. In this new context characterized by a wide choice of products and high ease of purchase, it becomes very challenging for brands to establish loyalty with the final user. For them, data analysis is fundamental to achieve segmentation of one and satisfy the increasing expectation of users and meet their hidden needs. For this reason, brands must offer continuous experiences to their user-based, such as participation in their fashion shows, or through collaboration with other companies coherently with their identity.

5.6. SUSTAINABILITY ASSESTMENT

Environmental Sustainability

The virtualization of world and fashion industry implies the abatement of garment production. This has positive repercussions on the environmental impacts of all the production phases of the value chain. Less water is used for irrigation of lands, pollution caused by the use of chemicals during production as well as emissions caused by logistics activities drop, and the dispersion of microplastics into the environment during the use of products is dramatically reduced. However, this scenario is still far from being environmentally sustainable. There is a sudden increase in the environmental cost of digital, which is showing its relevance due to the massive scale-up. This kind of pollution is often underestimated, but we can consider that the transmission of 1 GB of information takes an estimated 13kWh, which is equal to 7.07 kilograms of CO2. Since Google.com weighs 2 MB and it processes about 47,000 requests every second, the page emits 500 kilograms of CO2 emissions per second (Diaz, 2018). To operate these virtual realities in which users can move freely and which exist 24/7, large amounts of energy are required. This translates into exorbitant impacts in terms of carbon emissions. The environmental sustainability of fashion industry is not improved radically but the environmental problem are transformed.

Social Sustainability

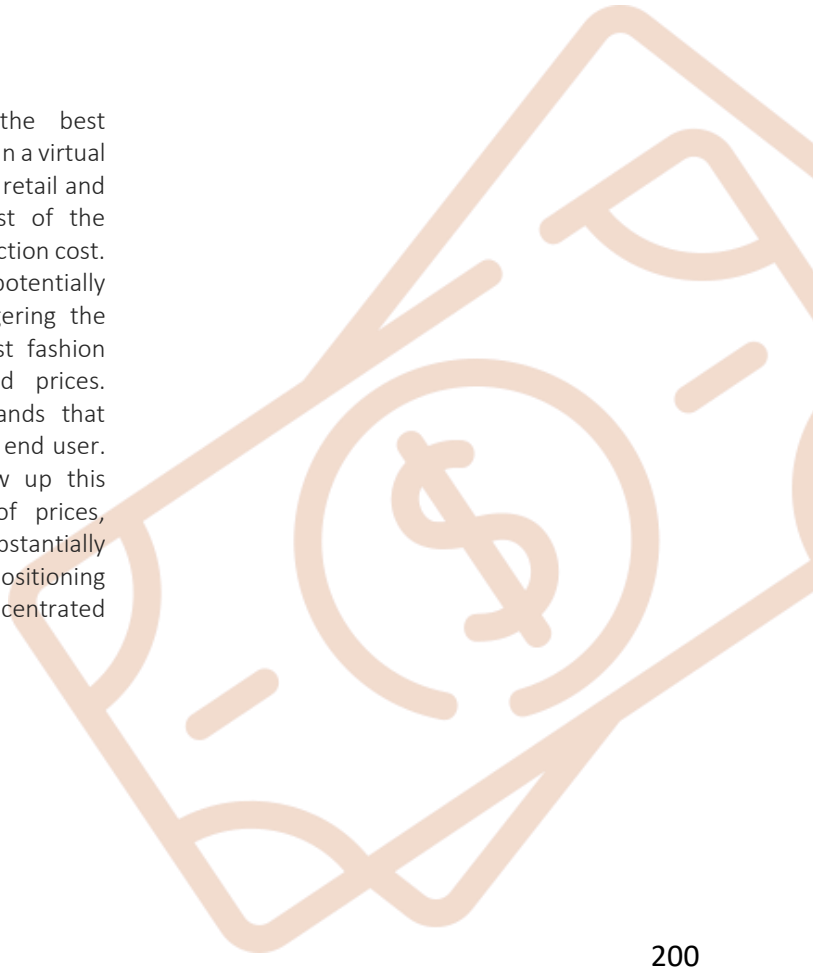
Fashion has always been a very labor-intensive industry. The impact of digital in this scenario has a disruptive force. Many jobs within the supply chain no longer exist. For example, large plants in developing countries, which used to employ millions of workers no longer exist. Even the most creative-intensive jobs, such as product design, are at serious risk. In fact, thanks to the enormous amount of data that companies will have at their disposal and the development of artificial intelligence, product designs can be generated automatically. The few products that are still manufactured are produced in fully automated factories and the professional figures that are needed are only the highly skilled experts in areas such as AI, robotics engineering, and algorithm programming. On the other hand digital solutions offer the opportunity to all people in the world to have an easier access to education and training, and at affordable prices, which allow them to apply for these new in-demand jobs. However, the number of new professionals needed is very small compared to all workers employed in the industry under current conditions. Despite this scenario would drastically reduce modern slavery, the balance between the job lost and added is negative. Therefore the social sustainability of fashion industry is not improved if compared to as-is situation.

Cultural Sustainability

In this hyper-connected scenario, where it is possible to interact at any time with anyone from anywhere in the world, country borders are becoming less and less important. The absence of boundaries fades local identities and encourages the establishment of global design standards. The typical peculiarities of local products and experiences risk to be forgotten, and with them also the tradition and the know-how, in favor of some standard that can partially all the users in the network. These dominant designs are defined by the big multinationals that, thanks to their huge resources, can make the most of the metaverse and reach the largest number of customers in the metaverse. The problem of cultural appropriation does not exist, because it is the variety of culture that has been lost. For this reason, Cultural sustainability is the worst performance of this scenario.

Economic Sustainability

Economic sustainability instead is the best sustainability dimension in this scenario. In a virtual world, production costs are replaced by retail and communication costs, making the cost of the product lower than the traditional production cost. This makes the products in this scenario potentially accessible to all people, without triggering the production practices of the typical fast fashion model to obtain reduced costs and prices. However, it is the positioning of brands that dictates the price of the garment to the end user. Therefore, if fashion companies follow up this lowering of costs with a lowering of prices, economic sustainability will be substantially improved, but if the logic of marketing positioning prevails, industry may be much more concentrated and prices may be higher.



PART II

SCENARIO 2: ENDLESS CARING

6.

6.1. ABSTRACT

In the second scenario, the fight against climate change has reached a turning point since there has been a serious and shared commitment after the climate crisis had become too frequent and severe. Already after the pandemic, which has made it even more evident how much the climate impact is fault of man's activities, something changed among people. A new personality has emerged prominently, the Carers. They are originally moved by a great sense of shame and consequently are willing to change their daily activities to embrace a more environmental-friendly lifestyle. Fashion, being one of the worst performers in terms of environmental sustainability, has been put under close supervision. Fashion players have understood the need for a transformation in response to the pressures and demands of this new personality. Consequently, the linear model leaves room to circular models and the value chain restructures itself to chase waste creation and embrace an endlessly circular model. From its origin, a fashion item is designed to have an infinite life cycle, by using more durable and sustainable materials, or to ease the disassembly process.
The sense of responsibility emerged by Carers, has also affected fashion players, which establish durable and trustworthy collaborations to share best practices and set industry standards for product design. Brands particularly are adapting their businesses models to embrace circularity, introducing remanufacturing, rental, and repairing. Community of Carers are arising, as a collective assumption of responsibility, to share tips and contents on how to extend product life, for example with repurposing activities. A paradigm shift in product value has come true, since value is not what is new and fashionable, but rather it is narrative behind the garment, which makes it worth to care of it.

Fig. 135 – Top signals Digital Immersion scenario

Keywords: Circularity, Recycling, Remanufacturing, Lifestyle, Narrative

6.2. THE CARER

The Carers are persona driven by an attitude of responsibility: anxiety for future perspectives and shame for individual behaviors are dominant in their personality. These feelings were already spreading before the pandemic, though it had a catalytic effect by showing with hard evidence the incidence of human activities on our planet's health. They blame themselves for unhealthy and unsustainable behaviors, that often are parts of everyday life. Therefore, they are strongly committed to taking responsibility and undergoing major changes, for example chasing daily waste generation and resorting to sustainable mean of transport. As for purchasing, they favor circular business model that enable extended product life through repair or second-hand, but require users to care about their belongings. If shame is the dominant sentiment, both loneliness and resentment have a relevant influence on their attitude. They came out from the pandemic with a stronger individual mindset, though, they are well aware that any action taken impacts others and therefore they feel responsible to protect present and future of a wider community. Shared responsibility on daily habits and behavior is seen as the only way to drive a bigger impact and guarantee a future for everyone. Apart from being future-oriented, the Carers are also worried about the status quo, especially as regards the social inequities. Though, they have a reactive attitude, by feeling partially responsible and taking a stand only when facing firsthand the darker sides of our society.

		Where	What	Feeling
First Sale		InfiniteLife Store Milan	Carer 1 buys a new garment from InfiniteLife, made of yarn 100% recycled from wasted clothes and with a design to guarantee full recyclability of the garment. Also, the packaging is made from recycled and non-toxic materials.	Satisfied
Resale		RE_Sale Mobile App	When Carer 1 no longer wishes to wear the garment, posts it on RE_Sale App, finds another Carer willing to buy it. They easily agree on price and delivery happens through a logistic player, without leaving home.	Responsible

		Where	What	Feeling
Repair		InfiniteLife Store São Paulo	The Carer 2 wears for a long time the garment, taking much care of it but one day it gets torn. Fortunately, InfiniteLife has not forgotten about that item and despite Carer 2 is not the initial customer, can just bring the garment to the closest store to have it repaired.	Relieved
Remanufacture		InfiniteLife Store São Paulo	After a while, the garment loses also Carer 2's preference; though, colours have faded and the garment is deteriorating so Carer 2 does not fell like reselling the garment again. InfiniteLife can retire the product and re-manufacture it, reinvigorating the fabrics and designing a new product.	Responsible

		Where	What	Feeling
Third Sale		InfiniteLife Store São Paulo	Carer 3 enters the store and explores the department with Re-manufactured clothes. Finds garments that have been made by parts from re-manufactured items, whose new design is absolutely unique and inimitable.	Delighted
Recycle		InfiniteLife Store Beijing	After few years, the re-manufactured garment has been through quite hard times and the signs of time passing by are becoming more and more evident. Carer 3 then brings it to the clothes collection bins where a specialised reverse logistic player collect clothes and bring it to recyclers. The fabrics will become new recycled yarns and the whole cycle will restart.	Responsible

Fig. 136 – User journey Scenario 2, Endless Caring

6.3. TRASFORMING THE WORLD

Decades-long neglect of climate change and exploitation of natural resources have devastated the planet and any further deterioration is a threat for humanity survival. The production freeze due to the pandemic period, has shown the relevance of human activities in determining climate change, which in turn has worsen scarcity of raw materials. Consequent increase in sourcing prices, coupled with the pressure from people who feel increasingly responsible for the worrying situation, has led to a shift in the dominant business models. There has been a spread of alternative business models mainly based on circularity, which break the traditional linear lifecycle. A product create value not only in a single transaction, but repeatedly, through sale, resale, repeated rental, repairing, and finally recycling which starts the loop over. Companies no longer focus on driving more volume and squeezing out cost through greater efficiency in supply chains, factories, and operations. Rather, they concentrate on rethinking products and services from the bottom up to avoid wastes of scarce resources.

From its origin, a product is designed to have an infinite life cycle, paying attention to any design details, and using more durable and sustainable materials. In circular models, there is a continuous exchange of information and products between customers and companies. For this reason, it is necessary to have a fast and flexible network. The current model of the global value chain, characterized by long lead times and lack of flexibility, does not fit well with the new needs. Nearshoring strategy instead enhance flexibility by reducing lead times and the inventory levels. At the same time shorter supply chains are proving to be better from an environmental point of view because of the reduced distances of shipping, and consequently the emissions. These disruptive business models are often born from start-ups that have grown and established themselves quickly, and that have forced even incumbents, initially reluctant to take this path, to look at these models and integrate them into their strategy. Incumbents response has been to enhance their absorptive capacity and collaborate with universities or act as business accelerators, funding the most innovative start-ups. Important developments have been made on alternatives to virgin raw materials, such as bio-fabricated materials grown in labs, cellulosic materials made from food waste, and chemically recycled textiles, which are made from previously existing fibers such as cotton and polyester. Industry leaders have understood their responsibility in driving the necessary changes and have an attitude well open to collaboration, sharing best practices, and seeking dialogue to set industry-wide standards. Major efforts are still deploy to communicate successfully the shift in product value paradigm: from consuming what is new and trendy, to valuing the narrative behind the products.

6.4. VALUE CHAIN

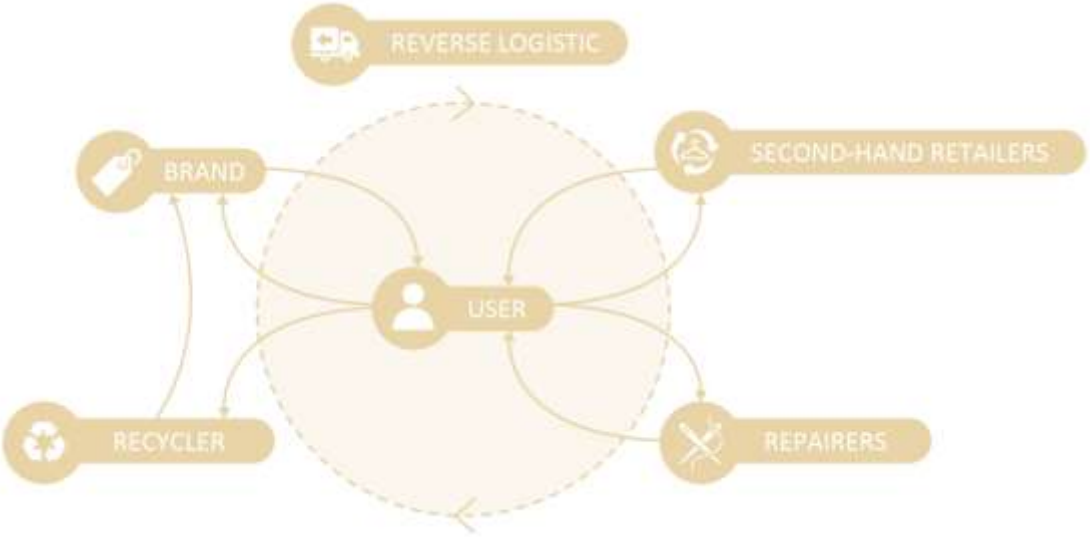


Fig. 137 – Value chain Scenario 2, Endless Caring

This scenario based on circularity is only made possible through collaboration between all players involved in the value chain. Brands play a key role in ensuring the viability of this ecosystem; indeed design is the most important phase since it determines the entire product life cycle. In fact, the choice of materials to be used affect the durability of the product and the possibility to be recycled. Apart from design, the added value of brands lays in their creativity and ability to be successful in transforming used garments to create new and unique products. In addition, brands provide their customers with repair services; though repairing can be done also by a dedicated businesses, the repairers. They are responsible for extending the life of a garment, replacing or repairing the damaged parts avoiding reaching prematurely end-of-life. Repairers are often small local businesses such as tailors, who have found a new impetus in this new system and are fundamental to provide a complete coverage. Second-hand players are those who deal with the resale of second-hand clothes. These can be physical players, meaning traditional stores where users can sell clothes that no longer satisfy them, or marketplaces dedicated entirely to the collection and sale of used clothes. Other online platforms have a peer-to-peer business model which means they act as an intermediary between sellers and buyers of clothes.

This benefits seller, who has a platform that guides them in creating the listing, and buyers, who have an easier and trustworthy shopping experience. Recyclers play another extremely important role in this zero waste paradigm. Recyclers receive all those non-wearable items that are too damaged to be sold directly or repaired. A first issue is the difficulty in monitoring textile fibers and chemical composition. To address this problem digital fiber tracking system have been developed which favor automated fiber sorting. Indeed, transparency on the materials flowing through the system is key to improving recycling rates. Once divided according to their composition, garments can be recycled to obtain new yarns, which are then used by brands to create new products. Secondly, logistics must be extremely efficient to ensure the right flows of products to recyclers, second-hand marketplaces, and brands. In particular, the biggest challenges are in reverse logistics, characterized by high handling costs and a complex system. Brands can contribute to facilitate the collection of used garments, by building collection points outside their own stores or by creating in-store circularity hubs; on the other hand logistic players and municipalities can co-operate to develop at home pick-up.

At it full potentiality the endless caring value chain entails three distinct cycles that extend product life one it no longer satisfies the needs of a user: user-user cycle, user-brand cycle, and user-recycler cycle.

User-User cycle

The first cycle includes all those activities that prolong the life of a product without the intervention of the earlier players of the value chain. Users can repair damaged clothes by themselves or leveraging on videos and self-repair contents shared by their online community. The community provides inspiration even when the product is too damaged to be repaired, but it can have a second life thanks to repurposing practices. If instead the user simply wants to sell the garments that no longer satisfy him, he can resort to different possibilities of resale. He can go to one of the many second-hand stores or through second-hand marketplaces, that thanks to efficient reverse logistics make the experience of returning the product simple and fast.

User-Brand cycle

The second cycle involves the interaction of the user with the brand producer. The simplest case is when an item needs to be repaired and the brand store is within his reach; in this case, user simply brings the product to the store and the brand take care of repairing. Differently, when the item can no longer be repaired, brands can remanufacture the fabrics into new products. User returns it to the brand via one of the many decentralized bins or brings it back to the store. Brands receive several damaged garments and spot the best combination of fabrics, hinges, and printings to make new designs, gifting to product uniqueness and craftsmanship. These remanufactured products can be put back on sale, acquiring an additional value, given by the narrative they have gained. The users are incentivized to return products to the producer brand because on one hand they can enjoy some loyalty benefits such as discounts or vouchers, and on the other hand they are well aware that the brand producer knows best its products and also the best procedures to successfully remanufactured the fabrics.

User-Recycler cycle

The third and final cycle relates the user to the recycler and is activated when products are so damaged and consumed by previous cycles that they need to be recycled. Thanks to continuous investments and a paradigm of open innovation between recyclers, start-ups, and universities, recycling technologies can reached a very high efficiency level. The products are equipped with a tracking system of materials and chemicals used in the production phase, and this facilitates the automated sorting of products. Moreover, design for recyclability practices create product that are 100% recyclable and streamline the recycling process. The ambitious goal of this phase is to close the loop and enable endless circularity. All products that enter this phase can be turned into new products or yarns to be used in later stages of production. Despite we can expect relevant improvement of recycling efficiency, still recycled fabrics lose quality; for this reason products cannot go through an infinite series of cycles. To address this issue, biodegradable materials can be a viable alternative, so that no harmful wastes are generated. Additionally, there is a huge amount of garments that have been produced with materials difficult to be recycled, which can go through the previous cycles but still reaching their end-of-life. For this reason, the recovery cycle dispose of all those products trying to minimizing the negative environmental impacts, for example with open-loop recycling.

6.5. BRAND

As previously mentioned the design and product development phases are crucial because their shadow is cast until the very end-of-life of a product. It is during this phase that companies make key decisions that might generate unexpected impacts during the following phases. To give some numbers, compared to 5% of actual costs that the design phase directly implies, influences 70% of the overall costs. That is why it is critical to act on this phase to achieve greater impacts on all subsequent ones. In particular, in the circular model, this phase is called circular design. Circular design requires rethinking the way products are produced and can follow two main paradigms: design for longevity and design for circularity.

Design for longevity
The aim is to extend the use phase of a garment by one or more owners and can be achieved through two different strategies: design for durability and design for reparability. In the first strategy, the key is to extend the life of a product by prolonging its usage. This can be achieved through higher quality materials in terms of strength, abrasion resistance, and shape resilience or by working on the emotional durability of the product, with styles that are timeless or that can be upgraded. Regarding the second strategy, product repair is an important part of a circular strategy as it extends a product life. Even products designed for durability will likely require repairing at some point, and envisioning how they can be repaired early in the design phase can ease the process. Usually, the parts to be repaired are buttons, holes, or linings. Brands need to provide repairing kits or services as well as guidance to users. Indeed, many users simply lack the knowledge and skills to repair the products even if the activities would be quite easy.

Design for circularity
Regarding the second paradigm of design it is meant to recreate value whenever a product reaches its end-of-life. Designing for circularity requires careful consideration on which components can be included in a product and how they can be looped back into the system at the end-of-use. In this case, three different strategies can be viable: design for disassembly, design for recycling, and design for biodegradability. According to the first strategy, products should have a few components that can be easily separated for reuse or recycle. Avoiding glues and surface treatments when possible, for example, is a good way to make components easy to detach and separate. The design for fiber recycling involves taking current material streams into account. It requires that all product materials, including chemicals, are carefully considered. The simplest solution is to make products with the least amount of different materials. The last strategy, design for biodegradability, means that products only include materials that decompose naturally and that can be returned to nature through biological cycles after use. Continuous investment in research and development is necessary for the circular design to find the latest advancements and keep track of new technologies and materials. Dialogue with all players in the value chain and with the most innovative realities such as universities and start-ups is therefore fundamental. It is also essential to create an authentic narrative around circular design to engage users and increase loyalty. Information sharing is an important tool to inspire and motivate users as well as creating a community around the responsibility of choosing responsible fashion garments

6.6. SUSTAINABILITY ASSESTMENT

Environmental Sustainability

Environmental sustainability is surely the best dimension for this scenario as fashion industry is designed no longer to be a systemic producer of waste but rather as an endlessly circular model. In this scenario, the initial phases of production, such as raw material production and fiber preparation, are almost exacerbated. Since this are the phases where the consumption of primary resources such as water and soil is critical, eliminating these phases have a relevant impact. Moreover, the model is structured to keep the garments as long as possible within the various cycles, which increase utilization rates and at the same time reduce demand for brand new garments. If the garments must be recycled, the recycling activity is less resource-consuming than the production of a new garment. In particular, we distinguish two types of products based on their durability. Some products are used more often, for example, underwear and t-shirts. Although their use is very high, these garments represent a problem in terms of accumulated waste. For these types of products, using biodegradable materials is the best solution to get the product into the user-recycler cycle more quickly. On the other hand, for more durable products, which are used less often, for example, sweatshirts or jackets, it becomes more important to ensure the durability of the product rather than its degradability, so that it can enter all the cycles described, remaining in circulation for a long time. In any case, the materials chosen must be recyclable, to guarantee a recyclability rate close to 100%. The positive impacts are slightly mitigated by logistics, which, to ensure the right product flows to all actors in the network, increases its level of activity. Brands can improve this performance by deploying compensative actions. For example, they can plant trees to compensate for the CO_2 emissions produced by the logistics phase.

Social Sustainability

One of the big changes in this circularity-based scenario is that there will no longer be the need for virgin natural resources. This causes almost the complete elimination of earlier stages of the supply chain, generating a relevant loss of jobs. However, new job opportunities are created. The recycling activity is one of the key stages to ensure circularity and needs a large increase in volume of products processed and consequently also of workers employed. This can offset partially the loss of jobs of the earliest stages in terms of quantity; surverly in terms of working condition quality we can expect a radical improvement. Indeed, on the earlier phases it is more common to find phenomena of child labor and modern slavery. Eventually, this scenario favors the return of local activities, such as repairers that were disappearing and can return to occupy a crucial role in fashion.

Economic Sustainability

Making products more sustainable costs more. Companies incur fixed costs in research and development to find more efficient recycling processes and materials. Furthermore, circular models need an efficient logistic system, and in particular reverse logistics, characterized by high handling costs and very complex management. However, the final user can have the possibility to access low-priced items. For example, the resale of products offers garments at lower prices compared to the original upfront price. The same goes for remanufactured products, since they use discarded garments as raw materials with lower sourcing costs. In addition, activities such as repair extend the useful life of the product. To evaluate a purchase users should move away from simply considering the cost of purchase, and adopt metrics that enhance the value of products, such as cost per wear. In this way, users perceive the value of a product not based on the upfront price, but weighting the many benefits in terms of quality and with a longer lifecycle.

Cultural Sustainability

To facilitate and guarantee the cyclicity of all the products introduced into the system, in this scenario we see the emergence of some design guidelines for the features that the products must and must not possess. For example, the types of fibers allowed, how to make the seams to facilitate the disassembly phase, how to make the treatments to ensure the durability of the product. When companies make a product, the priority is the environment. Therefore, it is no longer possible to make traditional products with traditional procedures and materials. Even these products must adapt to the new standards that are imposed by circular models. For this reason, we cannot talk about cultural appropriation issues, but traditional products may lose a lot of their peculiarities and distinctive si

PART II

SCENARIO 3: FASHION ACTIVISM

7.

7.1. ABSTRACT

The third scenario witnesses a world with deep social scars that are gradually healing. For decades social disparities have widened continuously, from wealth distribution, to access to primary services and goods. Social tension has continued to rise but with the Covid-19 pandemic something has change. We have witnessed the awakening of social consciousness and of an attitude of criticism. A personality has emerged particularly: the Activists. They are characterized by a strong resentment and are ready to raise their voices against the inequalities present in the world.
The fashion industry, being among the least sustainable from a social point of view, has undergone radical transformations. In fact, the old model of global value chains, characterized by a paramount difficulty in controlling the various phases and by a complete lack of transparency,
is no longer acceptable and accepted by society. People are demanding a repurposing of business, which implies abandoning the logic of profit to embrace a broader and more ethical perspective. The answer to this is the onshoring of the supply chain, with the concentration of activities and suppliers in one single territory. This facilitates control and respect for workers, with fairer wages and working conditions. This new model also leads to combat workaholism, by the revaluation of one's life, leisure, and values. Local production also leads to a change in the fashion product and brands, which become representative of a certain territory, its culture and fighting for its peculiar issues. Fashion has become an instrument of identification, of belonging to a movement, to ideals. Thanks to the application of new technologies such as blockchain, all the actors involved have the possibility to access trusted information over the origin of a garment and all the stages of production, with particular attention to workers conditions. Thanks to this technology, it is possible to sell even outside of the regional borders without harming the reliability of product information.

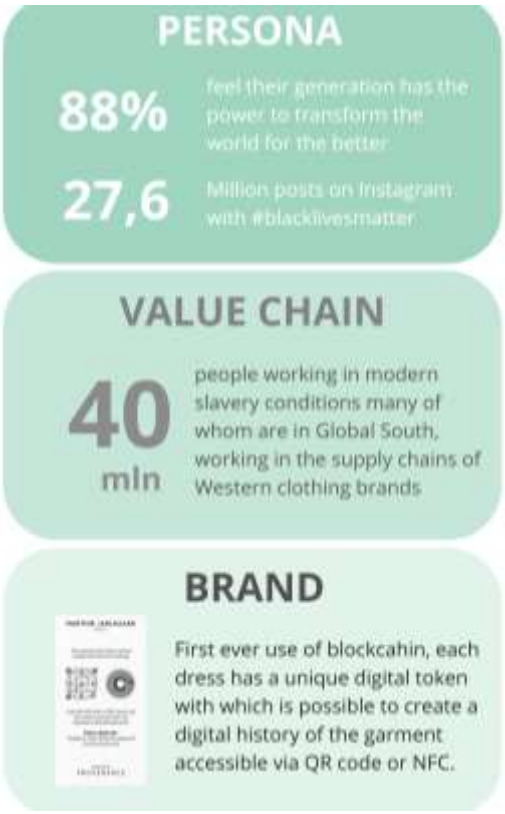


Fig. 138 – Top signals Fashion Activism scenario

Keywords: Activism, Transparency, Culture, Work dignity, Localism

7.2. THE ACTIVIST

The activists are personas driven by an attitude of criticism: they are willing to raise their voices and fight for society's inequities. They cannot accept the status quo and feel morally obliged to take a stand. They actively take the front row to defend the unprivileged. Activists are the most extreme personality, dominated by resentment. They are not ashamed, on the contrary, they blame the dominant dynamics of current society and those privileged who do not act for erasing inequities but continuously exacerbate divisions. They do not feel responsible for the world injustices and future uncertainty because they continuously fight for the cause. What drives them is not a feeling of owing and redemption, because of past responsibilities. On the contrary, they act firmly and faithfully to change the current society, driven by altruism and empathy. It goes without saying, that they are not feeling lonely; they experienced the pandemic restrictions but reacted and developed a deeper interconnection with the whole society. They feel part of a community of people and reject frugal relationships driven by interests, rather than kindness and trust. They require the whole economic system to change paradigm, detaching from profit, and embracing a purpose-driven approach. They want to recognize their own values even in fashion brands: respect of community diversity, equality of people, dignity of work, and freedom of identification and expression.

		Where	What	Feeling
Trigger		Social Media	During the daily activity of scrolling social media to get access to the latest news, the Activist gets in contact with a new initiative from FUTURE, a fashion brand denouncing the problem of child labour in Bangladesh.	Outraged
Immersing		FUTURE and ACTIVEFashion websites	The Activist visits FUTURE website, where can easily find information about the brands' commitments and its battles on behalf of child labour and support for education. Nevertheless, visits also the ACTIVEFashion website, to do cross-referencing. ACTIVEFashion is a no-profit organisation that discloses detailed data about fashion brands and assesses their activities.	Doubtful
Discovery		FUTURE website	Explores products of FUTURE, whose website shows comprehensive information regarding the production sites, workers employed, suppliers commitments, materials and processing choices. Buys the garment and receives a unique code that can be used to access the platform TransparentFashion.	Confident
Interaction		Transaprent Fashion platform	This platform is based on blockchain technology and it is possible to track each phase of the production of the single garment. At the beginning, it displays only materials, suppliers, and data about workers of pre-processed stages. While the product is being manufactured by FUTURE, the platform shows plant and employees that are manufacturing the item, their wages and working conditions. Finally, it also tracks the packaging and delivery information.	Delighted
Activism		The Activist Home	Receives the garment at home, with a unique label that allows to access the TransparentFashion report of ethical production. Based on this report, the Activist can create a post on social media and use it to start a dialogue around Bangladeshi child labor as well as about FUTURE commitments and battles.	Proud
Amusement		Social Media	Because of the cohesive community in which the activist lives, many people share their opinions and pledge their support to the cause. #stopchildlabour starts to spread and more and more people buy FUTURE products to support their battles; FUTURE becomes the symbol of a movement.	Powerful

Fig. 139– Value chain Scenario 3, Fashion Activism

7.3. TRASFORMING THE WORLD

Pandemic crisis has shown the structural inequalities and deep discriminations that constitutes our society, globally, regionally and locally. This led to the awakening of social consciousness and populations, loaded with resentment, have taken protests to the streets. Protests targeted institutions and multinational companies that were considered to be the real culprits that took advantage from world inequities. The impetus from grassroots and local initiatives has become an opportunity to transform businesses and respond to a deep sense of purpose. People demand an abandonment of profit as the dominant logic to embrace a broader and more ethical perspective on the role that business play in our society. Global value chains that has been the dominant model for decades are not accepted anymore. Their extremely complex nature, made up of numerous processes and large networks of economic agents distributed throughout the world, makes it extremely difficult to control the various production processes.

Taking advantage of the lack of control, many companies have been able to operate by exploiting workers and resources. Companies have been put under pressure to ensure greater transparency in their operations. The main strategy adopted to answer this request for transparency has been onshoring, meaning the concentration of all activities and partners in a single territory. The new production model favors the rebirth of a network of local players and smaller companies. This leads to the establishment of the relationships not transactional but rather based on partnerships. Localism helps the circulation of ideas within the network, leading to a high rate of innovation. The leading technology for a fully transparent supply chain is blockchain which, with its distributed database protocols, enables a complete audit trail across the fashion value chain. This new production model has eradicated workaholism from our society, according to which work is the centerpiece of one's identity and life's purpose. Respect for the workers and their rights, fair wages and adequate working conditions, as become a top priority. People reevaluate their priorities, giving back more value to their free time, which can be dedicated to their passions or social activities. In addition, continued pressure from various stakeholders and governments has caused companies to realize that it is no longer sufficient to simply mitigate their impacts, but they must start to act proactively to gain trust of their customers. More and more companies will adopt strategies that, apart from pursuing profit, seek to maximize their positive impact on employees, the communities in which they operate, the wider environment, and all stakeholders involved. In this reality welfare is a measure of success, inequality is not a by-product of the system but rather a metric of severe failure.

7.4. VALUE CHAIN

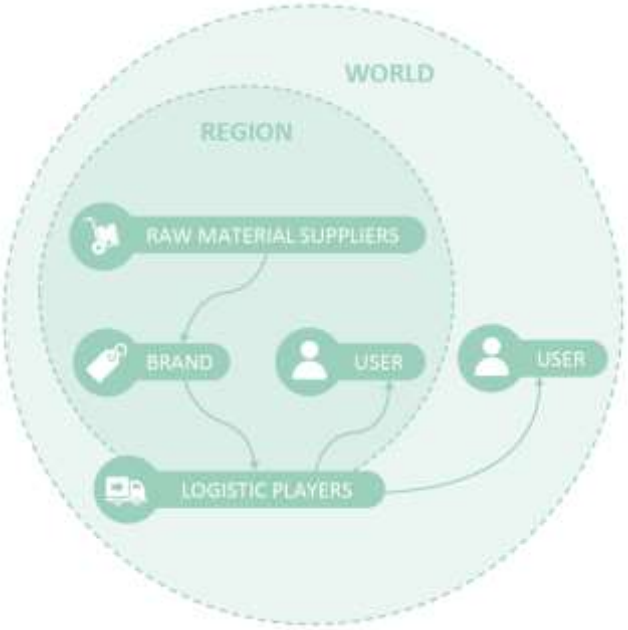


Fig. 140 – Value chain Scenario 3, Fashion Activism

The organization of the fashion industry with a model based on onshoring completely changes the dynamics and forces in act. This is a model that concentrate on the flourishing of local realities, and of smaller size companies to the detriment of big fashion multinationals. Resentment against big international companies forced them to undergo a drastic downsizing of their production, resulting in a less polarized industry. Not only does the size of companies change, but also the relationships between them. The sense of belonging to the same territory leads to the creation of deeper relationships based more on trust than on interest. Competition is not destructive as in a global value chain, but rather it is a fair force that stimulate process of continuous innovation, improving the local welfare. This new type of network favors the transmission of innovation and knowledge, and with this climate of trust, the coordination costs are radically reduced and procedures are simplified. Local networks enable to identify real needs of community and all the companies are involved in finding the best solution to the problems. As regard the supply chains, all the players must belong to the same region. As a consequence, brands do not have at their disposition an infinite catalogue of materials, but only those that naturally fit the local territory. This put a lot of pressure on adapting product and processes to resources available in a region and consequently it brings to the rediscovery of some traditional processes of the territories. These traditional processes become the scope of innovation, with new technologies improving efficiency and effectiveness. Despite supply chains are constrained within the regional boundaries, the market served by fashion brands is global. Digital solutions connect users around the globe with brands and their local territory and digital tracking system guarantee the veracity of products origin. Logistics players then are the only players that are allowed to operate outside territorial borders and act as a connection between the different regions.

7.5. BRAND

Localism of value chain leads brands to rediscover their territory of origin and enhance all the resources it offers. Brands feel part of a network and work for the benefit of the community in which they operate. First of all, the brand is an employer, which means it values the work of people therefore respecting their working conditions and wages. Moreover, in this scenario tradition blends with innovation, by mixing different sets of skills where human unique attributes of creativity and manual dexterity can be augmented by digital technologies and devices. Secondly, the brand is a communicator, meaning that it becomes the representative of a territory and the harbinger of its culture. The brand is actively involved in social initiative, denouncing and fighting for issues that are important for local community. Finally, the brand is a producer, so it makes products in which the cultural aspect reflects the territory to the point that users are able to identify the belonging of a product to a specific territory. Such a short value chain ensures easier traceability of the various production steps and greater transparency.

However, users that are distributed all over the world, need to trust more profoundly companies. Indeed, users are accustomed to cross-referencing to check if what is claimed by companies corresponds to the truth. A technology that helps create a fully transparent value chain is blockchain. It is a technology based on a distributed ledger, where each node in the network has a copy of this ledger. Every piece of information is mathematically encrypted and added as a new "block" to the chain of historical records. Information is recorded by distributing it among multiple nodes to ensure cyber security and system resilience. The contents of the registry are transparent and visible to everyone and can be easily accessed and verified. In the fashion world, this technology has significant impacts in terms of transparency. Each garment is identified univocally inside the network, enabling brands to verify every step of their production and create a digital history of that information including location data, content, and timestamps. The users are provided with a code that can be used in a dedicated third-party platform to access all these information. The users can thus have access to information on the origin of raw materials, suppliers employment policies, brand facilities involved in production, workers condition and wages, and shipments detail. Garments are equipped with QR codes or RFID which served a double purpose; on one hand it identifies the item univocally, on the other hands it enable user to have an easy connection to all data and information available. For example, users can find a final report of their own item sustainability performance which can be shared with their community online and stimulate dialogue around the issues that are addressed by the brand.

7.6. SUSTAINABILITY ASSESTMENT

Environmental Sustainability

The virtualization of world and fashion industry implies the abatement of garment production. This has positive repercussions on the environmental impacts of all the production phases of the value chain. Less water is used for irrigation of lands, pollution caused by the use of chemicals during production as well as emissions caused by logistics activities drop, and the dispersion of microplastics into the environment during the use of products is dramatically reduced. However, this scenario is still far from being environmentally sustainable. There is a sudden increase in the environmental cost of digital, which is showing its relevance due to the massive scale-up. This kind of pollution is often underestimated, but we can consider that the transmission of 1 GB of information takes an estimated 13kWh, which is equal to 7.07 kilograms of CO2. Since Google.com weighs 2 MB and it processes about 47,000 requests every second, the page emits 500 kilograms of CO2 emissions per second (Diaz, 2018). To operate these virtual realities in which users can move freely and which exist 24/7, large amounts of energy are required. This translates into exorbitant impacts in terms of carbon emissions. The environmental sustainability of fashion industry is not improved radically but the environmental problem are transformed.

Social Sustainability

Fashion has always been a very labor-intensive industry. The impact of digital in this scenario has a disruptive force. Many jobs within the supply chain no longer exist. For example, large plants in developing countries, which used to employ millions of workers no longer exist. Even the most creative-intensive jobs, such as product design, are at serious risk. In fact, thanks to the enormous amount of data that companies will have at their disposal and the development of artificial intelligence, product designs can be generated automatically. The few products that are still manufactured are produced in fully automated factories and the professional figures that are needed are only the highly skilled experts in areas such as AI, robotics engineering, and algorithm programming. On the other hand digital solutions offer the opportunity to all people in the world to have an easier access to education and training, and at affordable prices, which allow them to apply for these new in-demand jobs. However, the number of new professionals needed is very small compared to all workers employed in the industry under current conditions. Despite this scenario would drastically reduce modern slavery, the balance between the job lost and added is negative. Therefore the social sustainability of fashion industry is not improved if compared to as-is situation.

Cultural Sustainability

In this hyper-connected scenario, where it is possible to interact at any time with anyone from anywhere in the world, country borders are becoming less and less important. The absence of boundaries fades local identities and encourages the establishment of global design standards. The typical peculiarities of local products and experiences risk to be forgotten, and with them also the tradition and the know-how, in favor of some standard that can partially all the users in the network. These dominant designs are defined by the big multinationals that, thanks to their huge resources, can make the most of the metaverse and reach the largest number of customers in the metaverse. The problem of cultural appropriation does not exist, because it is the variety of culture that has been lost. For this reason, Cultural sustainability is the worst performance of this scenario.

Economic Sustainability

Economic sustainability instead is the best sustainability dimension in this scenario. In a virtual world, production costs are replaced by retail and communication costs, making the cost of the product lower than the traditional production cost. This makes the products in this scenario potentially accessible to all people, without triggering the production practices of the typical fast fashion model to obtain reduced costs and prices. However, it is the positioning of brands that dictates the price of the garment to the end user. Therefore, if fashion companies follow up this lowering of costs with a lowering of prices, economic sustainability will be substantially improved, but if the logic of marketing positioning prevails, industry may be much more concentrated and prices may be higher.

PART II

OUTPUT

8.

8.1. SCENARIOS COMPARISON

As introduced in the methodological part, the function of the three scenarios was to present three different realities that differed from each other and in which some aspects of them were taken to the extreme. The reason for this is to encourage dialogue about the main themes of the different scenarios so that brands can ask themselves how they can adapt to the different situations. The first difference between them is in the type of product offered. In the first scenario, there are sorely digital products. Users are no longer able to evaluate the workmanship of the production and the quality of the materials. They give more value to the experience they can have by interacting with the brand in totally digital environment. In Endless Caring the product is physical and characterized by high-quality materials that can ensure durability to the product itself. Users actively participate in trying to extend the lifespan of products, for example by participating in one of the many cycles made available by the circularity model. They can access the different cycles, such as sales through second-hand marketplaces as well as the other services offered, through digital devices, combining a physical and digital interaction. In this scenario, the value of a garment is not given by the newness of it, but rather by the narrative behind it.

	Product	Value
Digital Immersion	Virtual dress	Experience
Endless Caring	Physical dress	Narrative behind a garment
Fashion Activism	Physical dress	Contribution to community

Tab. 6 - Scenarios comparison based on product and value. Source: Author interpretation

In the third scenario, instead, the product is not just physical. Each product is made with the purpose of helping the community and the territory in which it was produced. The clients, when they buy a garment, research information about the contribution that brand has in the community. The more a brand actively participates in protecting its community, the more satisfied a customer is. Interaction with brands becomes phygital because in every moment, thanks to blockchain technologies, users can know all the phases of production of the garment and be sure that what the brand says corresponds to the truth. Moreover, in the different scenarios, we also detailed how the value chain restructures in these different realities. Digital Immersion is characterized by the extreme polarization of the fashion industry. Players with more digital skills, and specialized in the metaverse, are imposing themselves on other players in the industry. Often these multinationals come from other industries and they see fashion as an opportunity to be exploited. Since the priority of these companies is economic, they try to integrate more and more stages of the value chain into their offerings to gain margins on them. This expansion takes place mainly through Merges and Acquisitions of other players, and this contributes greatly to the verticalization of the industry. The virtualization of all processes makes the value chain very flexible as it is easy to scale up its capabilities with reduced investment. At the same time, this total dependence on digital makes it not very resilient.

In the first scenario there are solely digital products and users give more value to the experience provided by the brand. In the second one, the product is physical and the value of a garment is not given by the newness of it, but by the narrative behind it. In the third scenario, each product is made with the purpose of helping the community and the territory in which it was produced.

A hacker attack or any problem to the reality of the metaverse would lead to the block of the whole production system. In the second scenario, all players work together for a common goal, which is to better preserve the environment in which they operate. To do this, companies adopt circular models and, to improve their impact on the environment, they start to integrate into their activities also post-production phases, such as repair and remanufacturing, thus causing an increase in the verticalization of the sector. Brands are collaborating with: startups and universities to develop innovative and sustainable materials; with end-users to educate them to raise awareness and convince them to undertake more sustainable lifestyles; with recyclers to understand how to make products that can be disposed of in the most efficient way possible. These recyclers, to ensure the right volume of material for the next steps, are very large to be able to recycle all the different fibers, negatively impacting the flexibility of the industry. On the other hand, while the value chain model still has global connections, the nature of deeper partnerships with suppliers helps mitigate the impacts of future shocks improving the resilience. In the third scenario, the supply chain is organized in a local dimension. The polarization of the industry is minimal since it is composed of small entities. Verticalization is low since the each company specializes in a different phase of the value chain. They also develop a strong bond with the territory. This bond is shared by all supply chain agents, who cooperate with each other and forge deep, trustworthy relationships. These companies pursue not only an economic objective but also a social objective. Their purpose is therefore to support the community in which they operate, both by respecting the territory with raw materials and local production, and by offering products that reflect the culture. Their size, combined with their relationships with customers, stimulates a great sense of cooperation and belonging to a territory and has positive impact both on resilience and in terms of flexibility.

Digital Immersion implies a fully virtualization of all processes and is characterized by the extreme polarization of the fashion industry. In Endless Caring companies adopt circular models which increase collaborations within the value chain. In Fashion Activism the supply chain is scaled down to a local dimension which enable a deep bond with community.

The three scenarios present different hurdles to be overcome. Without the presumption of concretely evaluate the likelihood of the three alternatives, we would provide a qualitative reflection on three main difficulties: technological complexity, value chain compatibility, and user readiness. From a technological perspective, all three scenarios make use of technologies that are already in use today but at different stages of their development cycle. Digital Immersion is a scenario where the level of technology used is extremely high. Everything is based on a virtual system and a parallel model of reality, the metaverse, has developed. So even the fashion product becomes digital and the interactions with the different users take place in the metaverse. The only way to access this new world is through Virtual Reality gears. As of today, this technology is widely used in gaming, but it is also used in retail to transform the customer's purchase into a phygital experience. An example is Nike that allows their stores to use VR technology to experience the different steps in Nike's supply chain so users understand how and where items were made. (Marr, 2021).

	Supplier relationship	Priority	Objective	Polarization	Vertical Integration	Flexibility	Resilience
Digital Immersion	M&A	Economic	Entertain	↗↗	↗↗	↗	↘
Endless Caring	Partnership	Environment	Educate	→	↗	→	↗
Fashion Activism	Localism	Social	Support	↘↘	↘	↗	↗

Tab. 7 - Scenarios comparison based on Supplier relationship, priority, objective, polarization, vertical integration, flexibility and resilience. Source: Author interpretation

Literature defines the VR development curve at 75% with a time horizon of 2-5 years for full development (PMC, 2019). Then, virtual reality will be a mature technology in a short time and this will favor the birth of applications optimized on it, such as virtual malls, virtual stores, and all the experiences that can be made in the metaverse. Since this scenario is almost totally based on virtual reality, there will be a huge amount of data available and the development of Artificial Intelligence will be fundamental. AI allows for better management of customer interaction. For example, as described in the scenario, as soon as a brand comes into contact with the customer it can know the past purchases, the preferences and tastes, and is able to target users with the segmentation of one. AI technology is at 50% of its development curve, and it still needs about 6 to 10 years to reach its full potential and be ready to become the driver of success for the fashion industry (PMC,2019). The last technology that is crucial for the existence of the scenario is Non-fungible Tokens. They are essential because can guarantee the uniqueness of the items and the virtual ownership. This technology was born only four years ago, it has seen an exponential increase in its value in 2021, going from a sales volume in 2018 of 40.96 million dollars to 2.5 billion dollars in 2021 (Howcroft, 2021). In the second scenario, the development of technologies is aimed at reducing the environmental impact of the various phases of the value chain. With a logic of endless lifecycle recycling technologies become fundamental. Recycling has three phases: collection, sorting, and recycling processes themselves. Technologies can help in the collection phase, for example using smart bins. These can interact directly with reverse logistics providers, and notify their level of saturation, to optimize the route that logistics providers will make to collect the goods. In terms of sorting, technologies can serve to simplify this process. For example, by equipping garments with RFID chips containing information on the materials of which a garment is made and the recommended recycling. In this way, it is sufficient to scan the products to know which is the best process for it. Otherwise, some technologies can completely automate the sorting phase. An example is using near-infrared spectroscopy, which can detect fibers of which the garments are composed and sort them automatically (Circle Economy, 2021). In the second scenario the production of new material is practically reduced to a minimum, and recyclers must process a very high volume of garments.

In the first scenario technologies create a parallel model of reality: the metaverse.
In the second one, the technologies have the aim of reducing the environmental impact of the supply chain.
In the third one, technologies are used to ensure full transparency of the entire value chain.

These technologies, therefore, facilitate the recycling process and at the same time ensure the right flow of materials to the next stages of the value chain. As far as the recycling phase is concerned, it is difficult to provide a complete list of all the technologies used, since each material needs specific treatments. Some alternatives are for example: Worn Again, process able to convert polyester and polycotton blended textiles, to distinguish plastic components from the rest (Worn Again, 2021); Amber Cycle, a totally different approach that instead genetically engineered microbes to digest polymers and make new polymers that can be spun into yarns. Cycora™ is an example of one of the materials obtained (Amber Cycle, 2021); Circulose® is a dissolving pulp developed by Renewcell made from 100% textile waste instead of using wood-based natural fibers (Renewcell, 2021). As these examples briefly show, there are considerable technologies that can help with recycling. However, they have only just arrived on the market and are still rather slow processes in terms of material processed. Consider for example the latest technology discussed. Renewcell capacity to 500,000 tonnes per year, but global cotton demand is 700 times that figure (Roberts-Isalm, 2021). Apart from recycling, other technologies are needed to ensure the proper functioning of the various circular cycles present. An example is in peer-to-peer marketplaces. However, these systems rely on existing technologies that are already highly developed today. As regard the other activities, such as repairing and remanufacturing, these can be carried out mainly manually and with a low contribution of technologies.

In the third scenario, technologies are used to try to ensure full transparency of the entire value chain. The first step is digital traceability, which is the advanced capability around predictive and preemptive analytics. This technology is at 75% of its development and fully operational within 2 and 5 years and still needs to establish a common digital language for supply chain traceability within the industry (PMC, 2019). A more radical shift in information validation is Blockchain. Despite being a buzzword of our century there is a lack of knowledge about it. Blockchain-based solutions are not yet fast enough and further development is needed for the management of high-volume transactions. There are still many uncertainties about the future development and at least 6-10 years are estimated for it to be mature enough (PMC, 2019). Regarding production, we have seen that this scenario is characterized by smaller and local realities and the rediscovery of traditional products. However, this return will not coincide with a retreat of production technologies. In fact, workers will use the latest technologies alongside with traditional know-how.

The second dimension of analysis is value chain complexity. In fact, in addition to the different technologies needed to achieve the three scenarios, the configuration of the value chain also needs restructuring, from a point of view of the players, their relationships and forces at work between them. The first scenario is probably the most disruptive of all. As the value chain is totally virtualized, many steps in the value chain, such as cultivation, production, and logistics, are no longer necessary. All fashion becomes virtual, and this is a big risk for traditional fashion companies. The leaders in this industry are those who possess the skills and resources to manage the metaverse and are often companies that come from other industries and have seen fashion as a profitable area to invest in. Fashion companies need to prepare themselves to face these companies. They need to restructure their own competences; the development of technologies such as AI has made creative-intensive jobs, such as design, less required roles, in favor of new professionals and highly skilled experts in areas such as AI, robotics engineering, and algorithm programming.
In the second scenario, the product remains physical, so entire steps in the value chain are not destroyed. Instead, they will have to be repurposed to fit the endless circularity paradigm. The first steps of the value chain such as the cultivation of raw materials will continue to exist, but to a much-reduced extent as the raw materials and volume required will change.

Digital Immersion is the most disruptive as the value chain is totally virtualized, and many steps are no longer necessary. In Endless Caring supply chains move closer following a nearshoring logic and the main disruption is converting raw material producers into recyclers. Fashion Activism implies that the value chain are relocated to a local dimension, which means disrupting completely the current global model.

The garments that will still need raw materials, but which will be totally biodegradable, are those products that we have defined as fast-cycling, such as underwear. For all other products, totally recycled materials will be used. For this reason, most raw materials producers will convert into recyclers. Brands are also changing, regaining control over production. They are incorporating successive end stages such as second-hand, repairing and remanufacturing. At the same time, there will be a proliferation of small local repairers and second-hand businesses. The disruption of the value chain is not so pronounced as the product remains physical and the market global. Supply chains will move closer following a logic of nearshoring and the real change is in the upstream of the value chain, that is the conversion of raw material producers into recyclers.
In the third scenario, the value chain undergoes a major restructuring, as it must scale down all global activities to a local dimension. This means destroying all global supply chains and turning to local suppliers. This leads to a rediscovery of the territory, so the materials used, the processes to treat them, and the production methods change, becoming closer to the traditional ones. The professional figures employed within this scenario remain preserved and we see an increase in craft activities. The market remains global, thanks to digital channels, but the brand's focus must be on representing the local community.

A final dimension of scenario comparison concerns user readiness, meaning whether people are ready to embrace the new concepts of fashion. To assess this aspect, we performed a survey among Millennials and Genzers to identify the main concerns that are provoked by our scenarios. In the first scenario a problem concerns the need to own the right gear, such as VR equipment, to access the metaverse. However, with the development of this technology's prices will be lower and accessible to everyone. Our major concern instead regards the acceptance of the idea that the real fashion, made of catwalks, events and status symbols, is completely transferred into the digital world. In the second scenario, the first hurdle for users is the price of products, which will be slightly higher. Nevertheless, solutions such as resale make it possible to partially offset the additional expense. Likewise, remanufacturing and recycling offer cheaper raw materials.

However, from the user's perspective, there may arise a problem with the perception of garments, since often second-hand or remanufactured products are not perceived as high-quality products. Companies need to be able to communicate effectively with users the change of value behind a product, which is not in its prices and newness, but rather in its narrative. The third scenario also involves adaptation of users. The production model on which the fashion industry is organized can no longer guarantee the speed of production and delivery and the breadth of product choice. Users must get used to this new paradigm and have to carefully evaluate their purchase choices since their closets will be characterized by fewer products. Moreover, users need to evaluate products based not only on their price, which will be higher due to the smaller scale of production, but also considering the contribution of each purchase to the community.

8.2. OUR PREFERRED FUTURE

After having defined the main differences between the various scenarios, the next step, as explained in the research methodology, is to determine which of these scenarios is our preferred future, that is, the future that we would like to see become real. To determine which scenario to choose, it is useful to understand what the impacts of the different future could be. However, the scenarios are moving into the future and in a reality that has changed dramatically. All these makes it extremely difficult to quantify these impacts. Given the uncertainty of the business landscape in which the scenarios operate, we have chosen to use in this validation phase the Sustainable Development Goals developed by the United Nations. The reason is that these Goals constitute a collective and shared language and a clear direction to be followed by all nations and all businesses. Being able to understand how different scenarios impact the different SDGs is extremely important because governments are increasingly careful to measure and monitor the progress of these goals by companies, which are in turn increasingly held accountable.

Those businesses that are aware of and engage with the SDGs are more likely to have alignment with policies emerging in the future, making their business models more resilient. In addition, their structure, in which each Goal is divided into different targets, allows us to identify the biggest issues of each scenario and how the various scenarios impact the single targets and the overall SDG. Once the decision was made to evaluate the impacts of the 3 scenarios through the SDGs, the next step was to determine which of the 17 Goals, were the most relevant to the fashion industry and the scenarios we outlined. An initial skimming was done by considering the results produced by a survey conducted by PwC. The research developed a matrix based on the opportunities that the single goals have for businesses with the importance that these have for citizens (fig. a). In the proposed matrix we decided to exclude those goals with both negative dimensions, as they do not represent an opportunity for stakeholders and businesses (PwC, 2015). The next step was to map the value chain of a company in the fashion industry to understand which Goals were best suited for a company operating in this business. In addition, the Goals selected must also be able to consider all the impacts of the various stages of the entire value chain. Therefore, we selected SDG 8, SDG 12, and SDG 13.

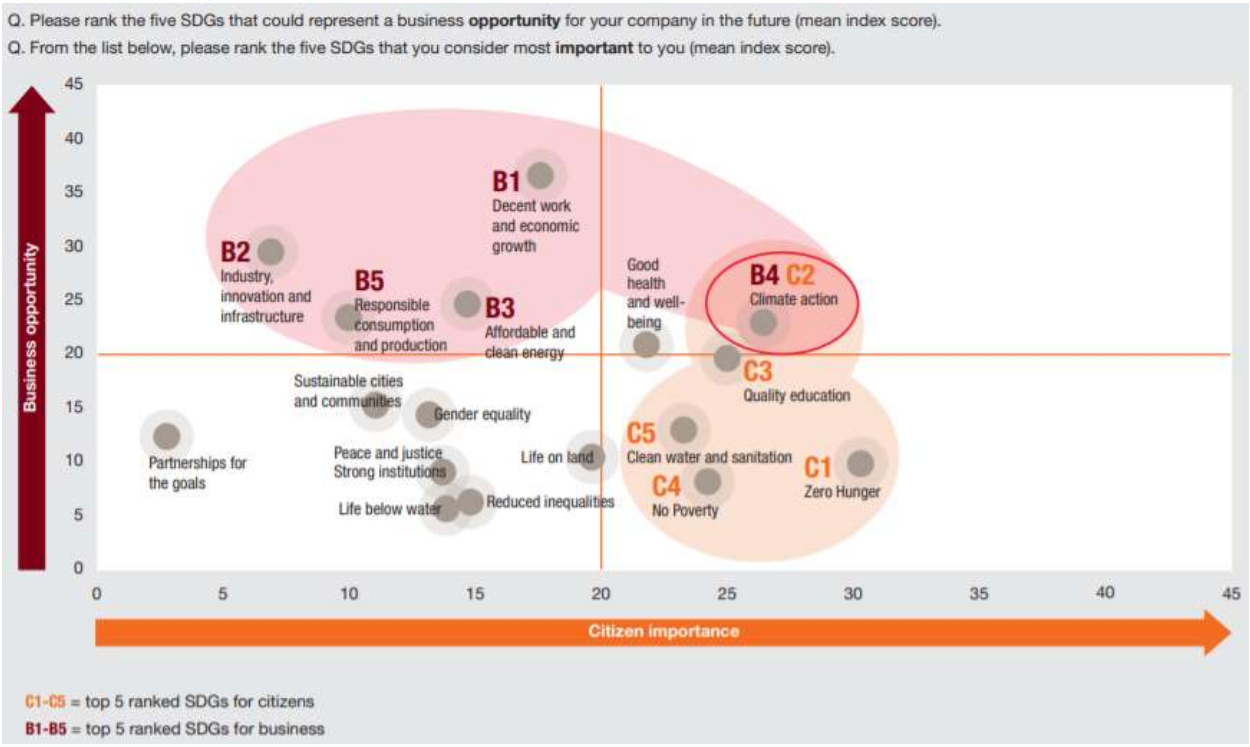


Fig. 141 – Matrix of the SDGs according to Citizen Importance and Business Opportunity. Source: PwC, 2015.

SDG 8 is to "*promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all"*. According to the United Nations still about half of the world's population lives on the equivalent of about two dollars a day. This goal, therefore, promotes economic and sustainable growth, through the reorganization of economic activities, the promotion of decent work opportunities. SDG 8 is structured into 12 different targets (UN, 2015).

SDG 12 aim to "*ensure sustainable consumption and production patterns"* (UN, 2015). Sustainable consumption and production refer to the promotion of resource and energy efficiency and sustainable infrastructures. Economic benefits are obtained through the reduction of resource use, degradation, and pollution throughout the production cycle, thus also improving the quality of life. To achieve all this, it is necessary to involve all stakeholders. It is important to make consumers aware of sustainable consumption and lifestyles. (UNRIC, 2021). The UN provides 8 different targets for pursuing this Goal.

SDG 13 discusses climate action and, in particular, cites *"Take urgent action to combat climate change and its impacts"*. All these thoughts 3 targets (UN,2015). The goal of this SDG is to counteract the impacts of climate change and the effects these changes have on people's livelihoods. Climate change is a global challenge that does not respect national boundaries. Emissions are everywhere and affect everyone. It is an issue that requires internationally coordinated solutions.

As we have said, these three SDGs have allowed us to cover all stages of the value chain. In particular, the first SDG refers to decent work, and therefore the control of child labor and decent working conditions. These issues are particularly relevant to the initial stages of the value chain, namely those that include fiber production, fabric production, and textile production, where there is often exploitation of workers and conditions of modern slavery. SDG 12 refers both to the production phase of brands, where it also focuses on a more efficient production system with less waste, and to the final phase, and especially the relationship with customers. Raising consumer awareness and promoting consumer education to improve their willingness to engage in sustainable consumption. Finally, Goal 13 takes into consideration the environmental aspect. Since fashion is an extremely polluting industry in all its activities, this SDG allows us to consider the impacts along the entire value chain. As was previously explained, once these 3 SDGs were identified, they were leveraged to determine how the three different scenarios impacted them. In particular, all of the targets of the selected SDGs were considered and an attempt was made to understand how the individual scenarios related to them. An evaluation was provided depending on how much the scenario impacted:

- 0 if the scenario does not consider the target
- 1 if the scenario considers the target
- 2 if the scenario moves towards the target
- 3 if the scenario achieves the target

Once the values were normalized, we obtained graph b showing the evaluation of the scenarios.

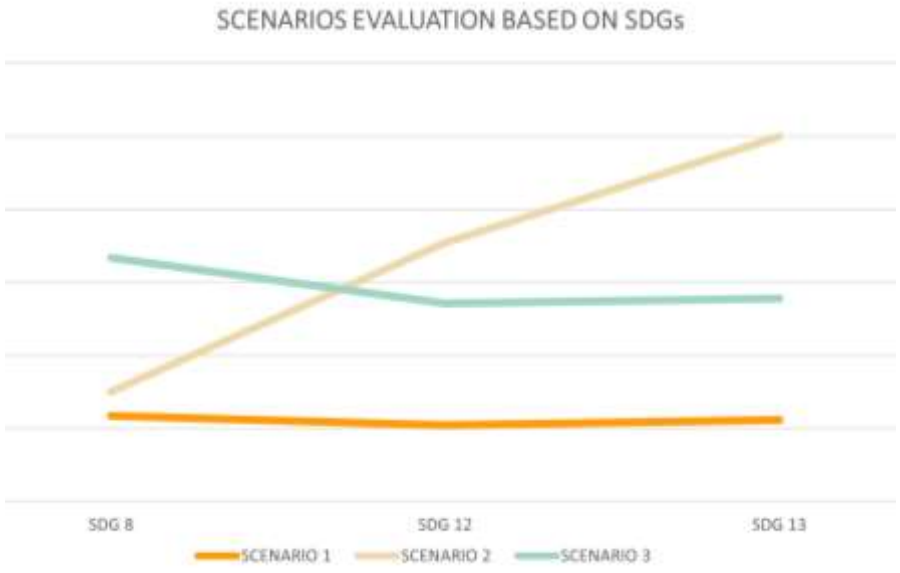


Fig. 142 - Scenarios evaluation based on SDGs. Source: Author interpretation.

The first SGDs that we consider is SDG 8, and as we note from the graph, it is scenario 3 that has the greatest impacts. In particular, it *achieves* targets 8.5, "by 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value", and 8.7, "take immediate and effective measures to eradicate forced labor, end modern slavery and human trafficking and secure the prohibition and elimination of the worst forms of child labor, including recruitment and use of child soldiers, and by 2025 end child labor in all its forms". This scenario focuses on the social aspect and respect of working conditions and therefore has significant impacts on the goal 8.5. A living wage is guaranteed to satisfy the basic needs of workers and their families, and maintain regular payment of wages while providing the best possible wages, benefits, and working conditions. The local dimension of the scenario also allows to control the behavior of suppliers and require documentation and proof of recruitment, working conditions, and procurement from suppliers, such as certifications of compliance with recognized standards. The impacts on 8.7 are to monitor workers' well-being and make this information publicly accessible and conduct labor inspections in operations and supply chain.
As regards the target 8.3, "promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises, including through access to financial services", scenario 3 is the best and *achieve* this target, while scenario 2 has some impacts and it *moves towards this target.* Fashion Activism scenario ensures responsible employment strategies, providing decent work and productive activities for all employees in their own operations and the supply chain. It also establishes fair policies for the selection of suppliers and improves economic inclusion throughout the supply chain. As regards Endless Caring, it encourage the formalization and growth of MSMEs. Particularly in this scenario, brands play the role of accelerators, especially for start-ups and innovative MSMEs, providing access to credit, support for growth, integrating them into the global supply chain, particularly in developing countries. Endless Caring is the best is target 8.4, "improve progressively, through 2030, global resource efficiency in consumption and production and endeavor to decouple economic growth from environmental degradation, in accordance with the Ten-Year Framework of Programmes on Sustainable Consumption and Production, with developed countries taking the lead". Thanks to the implementation of circular business models to further reduce the business' environmental impact, improvement of resource efficiency as well as increase supply chain, and resource security. In addition to the extension of the business' responsibility for a product to the post-consumer stage, including waste collection, reuse, and recycling. The first scenario succeeds in having a high impact on target 8.6, "by 2020, substantially reduce the proportion of youth not in employment, education or training" which can *achieve*. One of the advantages of a fully virtualized scenario is that education will also be virtual, including universities and training courses, which will then be accessible to everyone from all parts of the world. Companies can help understand what current and future skills are needed and implement appropriate workplace training programs.

For SDG 8 it is Scenario 3 that has the greatest impacts, since this scenario focuses on the social aspect, respect of working conditions and control over the behaviors of suppliers. It is followed by Scenario 2, where brands play the role of accelerators, especially for MSMEs. The last is Scenario 1 that offer only a virtual and more inclusive access to education.

Endless caring is the best compared to all other scenarios in the SDG 12. In particular it *achieve* the target 12.2, "by 2030, achieve the sustainable management and efficient use of natural resources", and on target 12.5, "by 2030, substantially reduce waste generation through prevention, reduction, recycling, and reuse".
As regards the 12.2, thanks to the circular models implemented, the businesses pay attention to understanding sustainable management and resource efficiency in all operations, products, and services.

Furthermore, they use renewable materials and efficiently clean and technologies to reduce the risk of over-exploitation of natural resources and they extend responsibility to the post-consumer stage of a product to further reduce their environmental impact. Target 12.5 is met considering carefully the waste. Even in this case, the focus on circularity allows the use of renewable, bio-based, or fully recyclable inputs, recovering resources. They promote the extended responsibility to the post-consumer stage of its lifecycle and change the consumer behavior around product use, connecting users to encourage shared use and providing products as a service to achieve product life-extension and utilization. In terms of impacts scenario 2 is followed by scenario 3 that address well target 12.1, “implement the 10-year framework of programmes on sustainable consumption and production, all countries taking action, with developed countries taking the lead”, and target 12.6, “encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle”. Target 12.1 is *achieved* because companies in this scenario are not driven only by economic interest but have a wider purpose, respecting human rights, social and environmental impacts can incorporate sustainable development into business vision, policies, and strategies and developing sustainability targets and indicators across products and services, with a strong focus on developing countries. Target 12.6 is achieved because Fashion Activism is a scenario characterized by full transparency. So companies communicate how human rights impacts are being addressed and how sustainability principles are being introduced into business practices. Scenario 1 partially succeeds in impacting SDG 12. Being Digital Immersion a reality almost totally virtualized and in which the products that are still physically manufactured are made in highly automated industries, it can *consider* target 12.5, reducing the problem of waste, and target 12.4, "achieve the environmentally sound management of chemicals and all wastes throughout their lifecycle, by agreed international frameworks, and significantly reduce their release to air, water and soil to minimize their adverse impacts on human health and the environment", thus improving soil pollution and the release of chemicals. However, these are replaced by emissions in terms of CO2.

For SDG 12 it is Scenario 2 that has the greatest impacts. This scenario is based on circular business model that improve the resource efficiency in all operations and reduce waste.
Scenario 3 achieve some targets thanks to the wider purpose of companies.
Scenario 1 impacts due to the drastic reduction of production and the pollution related.

Regarding SDG 13, from graph b, it is clear that scenario 1 is dominated by all the other scenarios. Digital Immersion does not address environmental issues carefully and *only considers* targets 13.1, “strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries”, and 13.2, “Integrate climate change measures into national policies, strategies, and planning”. For 13.1 consider only the disclosing of GHG emissions and look for an improvement in the efficiency and climate resiliency of operations. While 13.2 merely considers the risks and opportunities driven by changes in regulation. Better performances on these two targets are obtained in scenario 3, which succeeds in *achieving* target 13.2 by stimulating collaboration with governments on ambitious policy solutions for climate change and scaling up climate actions through, providing testimonies, contributing to campaigns, and communicating with customers, suppliers, and the general public and aligning corporate practices with public policies. Also regarding target 13.1, it succeeds to *move in its direction* since the local value chain improves the climate of collaboration with suppliers to improve supplier sustainability management and prevent supply chain interruptions or delays due to climate change.

Scenario 2, on the other hand, *achieves all three targets*. For target 13.1 this scenario invests in environmental protection and in improving the resilience to environmental hazards and resource scarcity throughout operations resorting to the development of new fibers and the extension of the life of the garments. For target 13.2 companies responsibly engage in climate policy by identifying implications, influences, and opportunities to engage with their circular business model. They also align words with actions and reporting. In addition, scenario 2 is the only one that addresses target 13.3 "improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction, and early warning". Among the activities conducted by the companies is that of providing training and educational activities, and having a clear communication strategy around risks, goals, and the associated benefits. In addition, companies in this scenario strive to promote the establishment of knowledge networks in climate change, including developing relevant industrial standards and investment principles.

For SDG 13, Scenario 2 outperform the other scenarios, investing in environmental protection, engaging in climate policies and educating on climate change mitigation. It is the only one to achieve all the three targets, whereas Scenario 3 only moves in these directions thanks to localism, which stimulate collaboration with governments. Scenario 1 is instead dominated since it only takes into consideration these targets.

We have discussed thoroughly the main characteristics of the various scenarios, adopting a comparative approach and quantifying as much as possible the potential impacts. This long discussion was made to support the process of preferred future identification. Indeed, if this choice has a subjective nature, we wanted to have a clear view on strengths and weaknesses of the three scenarios in terms of sustainability enhancement of the fashion industry. Our final choice has fallen on the second scenario: Endless Caring. Indeed, the compatibility of this scenario with Sustainable Development Goals is promising. SDG 12, "ensure sustainable consumption and production patterns" and SDG 13, "take urgent action to combat climate change and its impacts", are significantly achieved by Endless Caring scenario since it is the only scenario that considers all the targets of which these two SDGs are composed of.

As regards SDG 8, "promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all", only the Fashion Activism scenario outperform Endless Caring, since it is focused on the social issues. Though, from a comprehensive perspective Endless Caring is the most promising scenario. If we look at the difficulties of realizing full potentiality of scenarios, Endless Caring is least disruptive both from a value chain point of view, which remains global and similar to the current situation and from a product point of view, which continues to be physical. Endless Caring also mitigates the negative impacts on workers, since the disrupted jobs can be more easily reallocated in the new value chain; avoiding the resistance of workers to this transition. Finally, from a technological standpoint, this scenario leverage on technologies which have almost reached their maturity.

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PART III

PAVING THE PATHWAY

PART III

GUIDE FOR A TRANSITION

9.

9.1. BACKCASTING INTRODUCTION

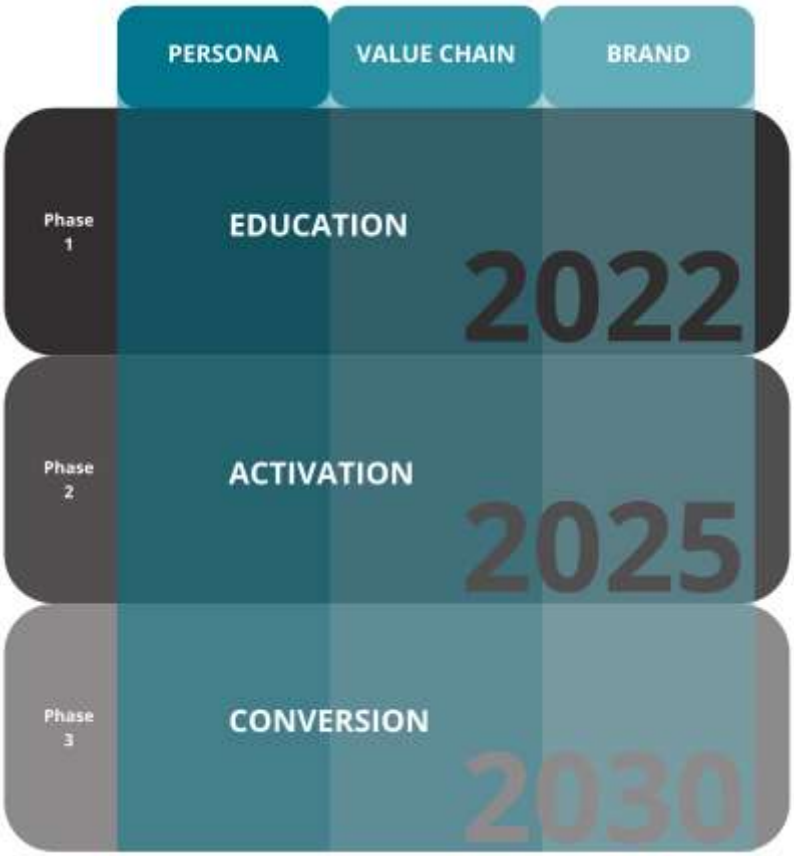

Fig. 143 - Transition Pathway Overview

In the previous chapter we conducted an extensive digression to determine our preferred future, which turned out to be Endless Caring. Once identified the preferred future, we could pass to the successive phase that is the backcasting. The basic idea of this process is to project back long-term visions of desired futures until the present and create a transition pathway in which projects become steps in this transition. To aid in the transition, three distinct phases have been identified in which incremental actions must be taken in the direction of people, value chain and brand evolution, which are the same dimensions considered during scenario creation. The first phase encountered is the Education phase, which must be implemented by 2022. This initial phase focuses on educating stakeholders and raising awareness about the unsustainability of the current fashion model. Then, the Activation phase, to be realized by 2025, in which the industry begins to take its first steps towards a circular model, and users actively participate in this transformation. Finally, the Conversion phase, which achieves a 100% circular business models adoption by 2030. For each phase, we provided a map with the main steps that need to be implemented at the three levels of analysis, and then some considerations on how each phase contribute to the transition progress, using SDG and describing qualitatively the progressions of the main cycles introduced by our model: repairing, repurposing, repairing, remanufacturing, recycling, and recovery. Particularly, for the second and third phases we developed an additional map to help track the progresses from now until the due date. This map defines some metrics for each key step, and also some main goals which would help to synthetically measure the progress of persona, value chain and brand in a mid- and long-term view.

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9.2. PHASE 1: EDUCATION

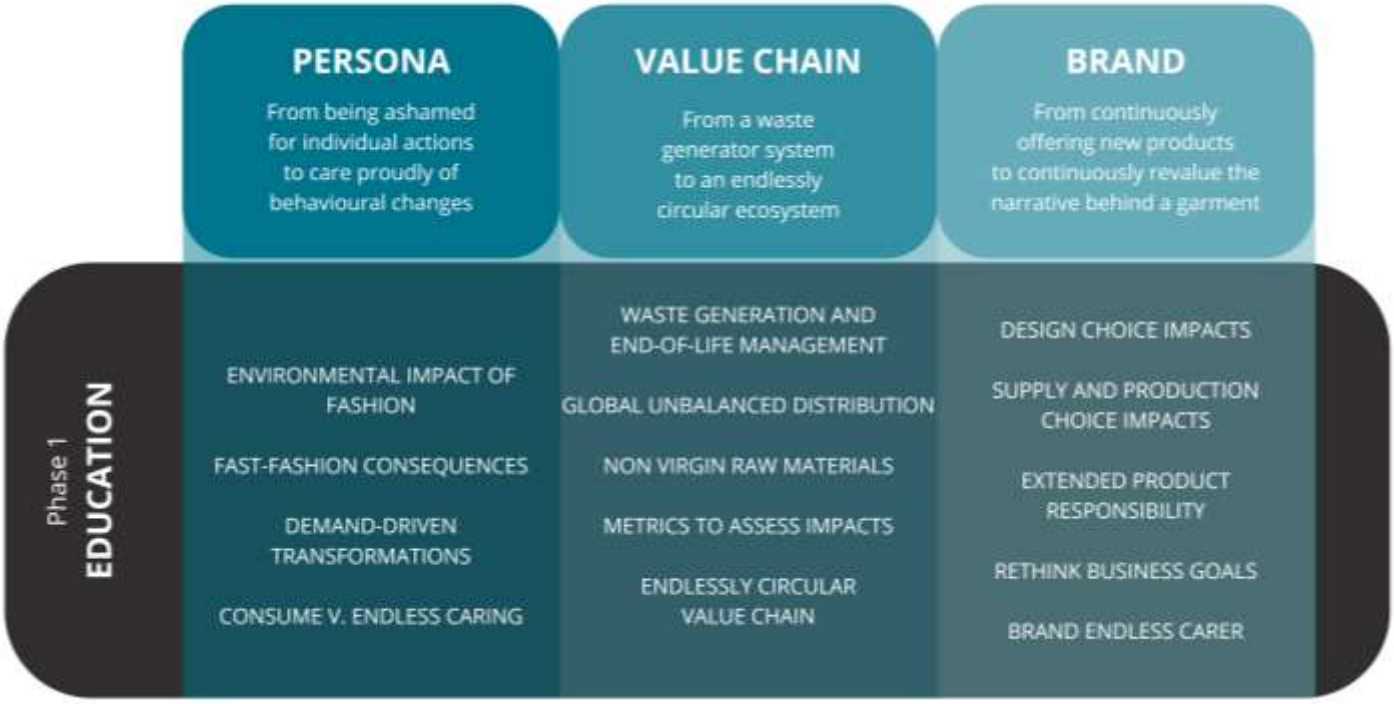

Fig. 144 – Phase 1: Education Phase

The *persona* is to educate about the unsustainability of the current fashion system with a focus on the environmental global impacts. Particularly on the impacts that are attributable to the affirmation of fast fashion and the spread of its business model, based on low prices and low quality of products, which encourage frequent purchases and reduce usage of fashion items. Starting from their daily behaviors, users have a serious impact and drive radical industry transformations. It is responsibility of people then to act immediately on their daily behaviors to tackle climate change. Endless Caring consumption proposes a paradigm where fashion is not made to be consumed; rather the concept of consume is surpassed, in favor of seeking value and caring of belongings, fashion products included.

The *value chain* is educated about the unsustainability of the current fashion system with a focus on waste and end-of-life management. The weaknesses and inequities due to global value chains are evident, especially considering the unequal distribution of activities. Alternatives to virgin raw materials are necessary to reduce radically upstream environmental impacts: recycled and biodegradable fibers are the most valuable solutions but need investments. As for the materials already in use, it is necessary to introduce recovery activities such as open-loop recycling to reduce negative impacts at minimum. Moreover, the industry lacks metrics to coherently assess actual impacts and monitor progresses over time so players can agree on shared metrics. Finally, Endless Caring value chain is proposed, introducing the concepts of endless circularity and all the complementing cycles that need to be started.

The *brand* is educated about the unsustainability of the current fashion system with a focus on the different design, supply and production choices. Brands need to become aware of their responsibility choices, which determine most environmental impacts of products as well as social issues, especially in the choice of suppliers. Brand responsibility still does not finish with the product selling but it is to extend also to the use phase and the end-of-life, through repairing and recycling cycles.

Brands need also o rebalance their goals, considering social and environmental goals along with business ones. Endless-caring brand paradigm is proposed, which implies from logic of fast fashion but seek at exploiting all the value that a product is able to deliver, adopting lifecycle thinking and circular design strategies.

Fig. 145 – Phase 1 impacts on SGGs

The Education phase attacks already all the three SDGs we have considered, and specifically 7 targets. Through educating users, brands, and the whole value chain about consumption behaviors as well as circular production, it is possible to decouple economic growth from environmental degradation as Target 8.4 prescribes. In addition, at this phase, problems such as modern slavery and underpaid workers are brought to light. These are dynamics rooted in a complex and poorly controlled model such as the current global value chain. A system based on full circularity allows the elimination of the initial phases of cultivation in the crops that are the areas most affected by the problems described above. The requalification of workers in these phases in more controlled environments and with a salary adequate to guarantee a living wage allows at the same time to meet target 8.5 and target 8.7. Businesses actively act to raise awareness by for example providing training and educational activities, and having a clear communication strategy around risks, thus meeting target 13.3. This proactive attitude of the companies encourage users to choose more environmentally friendly and responsible products and services; on the other hand the design of circular models improve sustainability of production, addressing then also targets 12.1 and 12.8. Finally, in the Education phase brands realize the impacts and implications of their business and that they need to integrate climate change in their planning and strategy activities, as suggested by target 13.2.

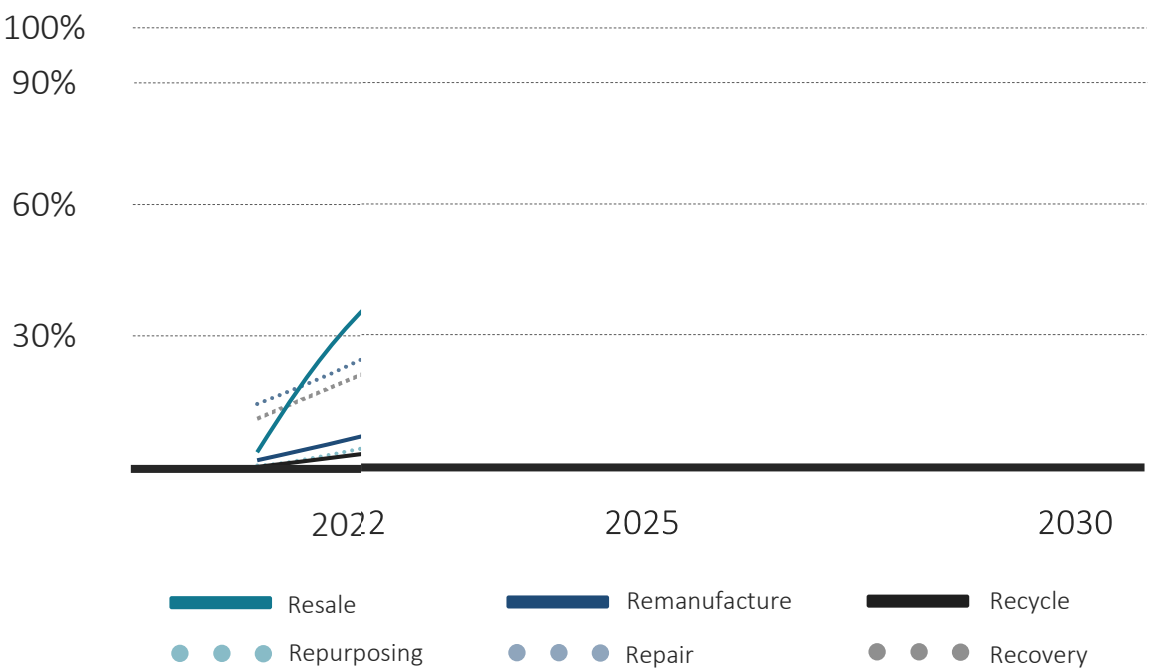

Fig. 146 – Phase 1: Education Phase, three cylces

In the education phase, the three cycles are still in the early stages. In particular, the user-user cycle, characterized by resale and repurposing. Resale is a service that is already rapidly expanding today. However, it has not yet reached its full potential due to a reverse logistic that has not yet reached full efficiency and the low availability and accessibility of services that offer resale opportunities. While repurposing is almost absent since to develop it needs a community, which at this stage has not yet formed. The user-brand cycle is based on repair and remanufacturing. The repair phase is had already begun to take off, especially for the ease of adoption and the impact, it has on customer retention. In 2022, this offering is being integrated by many brands into their services. As regard remanufacturing, it is at an initial phase. The products have no production standards and therefore each product is assembled and has undergone different treatments. This means that each item has to be remanufactured by hand and without ever following the same procedures, making this activity time and cost-consuming. The first remanufactured items are beginning to appear on the market, but they are made bybrands more as experiments and with marketing logic.

Even the user-recycling phase is not fully developed. The problem at this stage is that the lack of manufacturing standards causes a large number of products to be made of different materials and to have undergone different treatments during production, which makes it difficult to recycle. Nevertheless, some technologies allow for the automatic sorting of products or that help in separating the different fibers a garment is composed of. The problem is that these technologies are not yet widespread, have high investment costs, and therefore can treat few materials. This also has an impact on the subsequent phases, since by doing so, recycled materials are not available for the production of new garments. The last phase to consider is recovery. Recovery is the concept of open-loop recycling, meaning those materials that are recycled to become part of other products, such as mattresses. There is an increase in recovery thanks to new solutions to make open loops that avoid that the garments being incinerated or ending up in a landfill.

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9.3 PHASE 2: ACTIVATION

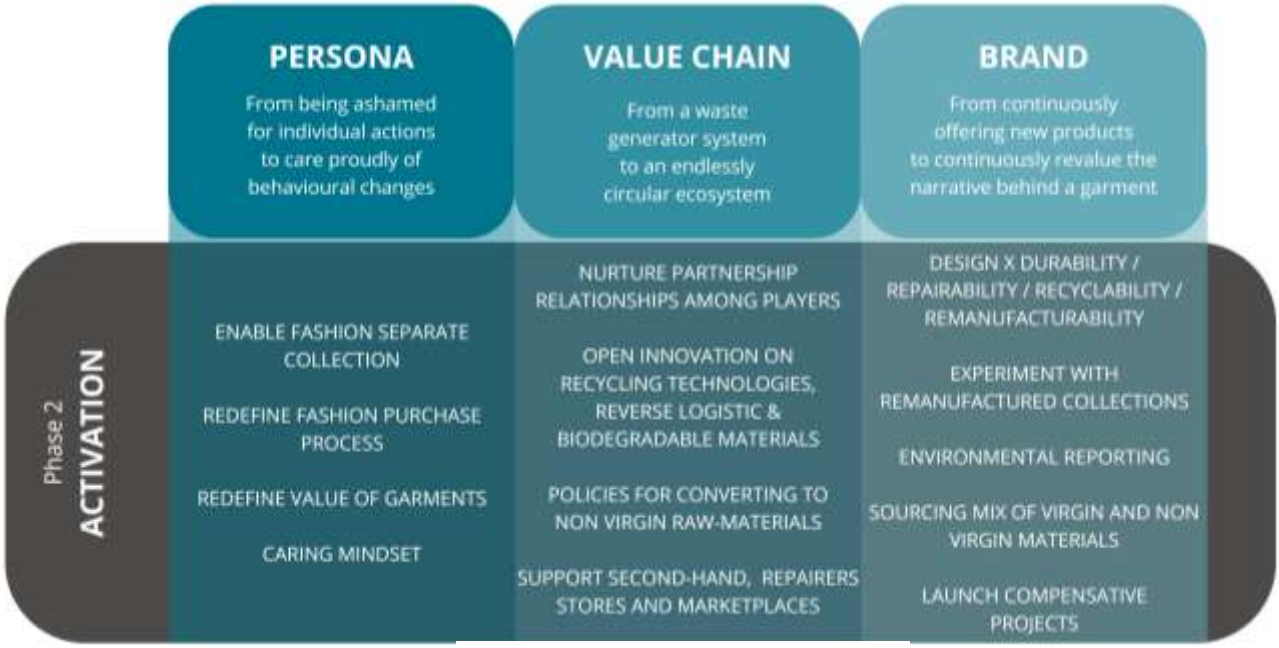

Fig. 147 – Phase 2: Activation Phase

In the activation phase, the *persona* can start at home the first steps towards circularity and fight of waste. Thanks to condos bins are able to collect fashion garments directly at home. This will facilitate the processes of reverse logistics. The value of products is no longer based only on the price of purchase. In the evaluating process, the persona is considering the availability of additional information about sustainability and the impact that the product had on the environment. For example, second-hand product increases their value in the eyes of the persona. The persona redefines the process of purchase. He is not interested anymore in a type of fashion quick and impulsive. He evaluates carefully their purchases because he is willing to enjoy for a long time product, that never lost its value but is always ready to get a new purpose through one of the different circular options available.

In the activation phase, the different players are conscious that the transactional approach is not more sustainable and are moving towards a more deep partnership. There is a new sense of trust and a shared commitment among the value chain players. This new type of relation facilitates the diffusion of the open innovation paradigm along the value chain. The different actors collaborate to scale up recycling technologies and new solutions for reverse logistics. There is a focus on new types of materials to be used as alternatives to the virgin ones and experimentation of solutions such as smart bins to optimize the picking processes. The adoption of new materials is incentivized by industry-shared policies that aim to eliminate the use of virgin materials. In the activation, phase is important to support repairers, second-hand shops, and marketplaces. It's fundamental to scale up this type of solution to be able to meet the increasing demand.

In the activation phase brand adopt new types of design so that new garments start to fit within the endless cycles. There is the emerge of Design X Durability, Repairability, Recyclability and Remanufacturability. The remanufacturability design and the availability of used garments help in the diffusion of clothing collections that are fully remanufactured. Brands start experimenting with remanufacturing mainly not through technological intensive processes, but in a more traditional way with cutting and sewing.

While according to the design for recyclability, brands must increase the share of non-virgin materials in their sourcing mix. In the activation phase, all the products should display partial information about their sustainability. Brands should also make an available environmental report. All these start paving the way for transparent and trustworthy communication with users and stakeholders.

Fig. 148 – Phase 2 impacts on SGGs

In the Activation phase, we still act on all three SDGs. If the previous phase was focused on education and raising awareness of people, this phase is instead focused on innovation. In fact, the players in the value chain adopt an open innovation paradigm so that, as defined by target 8.2, it is possible to "Achieve higher levels of economic productivity through diversification, technological upgrading, and innovation". The big brands act as incubators favoring the acceleration of start-ups and MSME enterprises, supporting them in their development and financial activities and this allows the achievement of target 8.4.
In the open innovation paradigm, investments are directed towards actions that increase the resilience of the supply chain, as defined by target 13.1. For example, the search for new materials that grow in the laboratory allows companies to hedge against the increase in resource scarcity and the continuous increase in natural disasters that ruin crops. The new materials and new types of design that are adopted at this stage make it possible to prolong the life of the garments and consequently to considerably reduce the creation of waste, target 12.5.Fundamental at this stage for companies is the measurement of their impacts with which it is possible to provide adequate reporting. Reporting economic, social, and environmental sustainability using a common international reporting standard makes it possible to meet target 13.2 and target 12.6 at the same time.

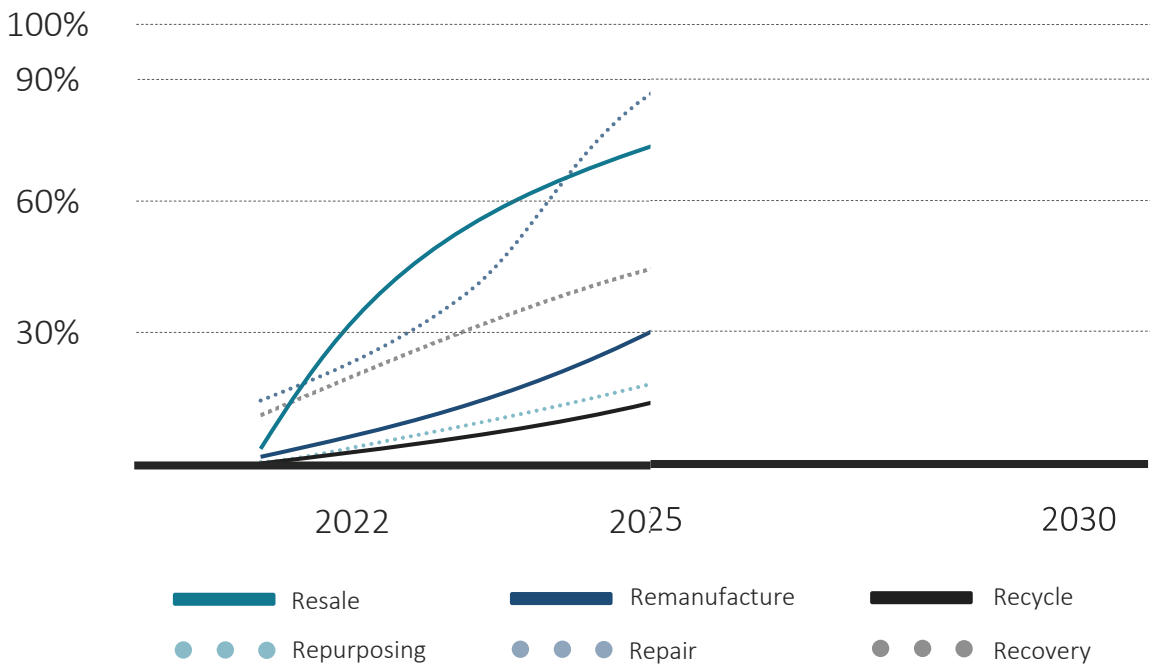

Fig. 149 – Phase 2 Activation phase, three cylces

In the activation phase, the resale is one of the cycles that has had the greatest growth. The growth of the resale is due to the expansion of the network of second-hand shops and the partnerships of brands with second-hand digital marketplaces. In addition to this, there is also a change in perspective on the part of clients who, in the purchasing phase, also consider the impact that a garment has on the environment. The second-hand product increases its value in the eyes of the persona. The repurposing phase still cannot resort to an established community in order to develop its full potential. The user-brand cycle has had the greatest growth, thanks above all to the repair boost. Repair is now a commonly used service within brands. Moreover, when buying a product, customers are also given spare parts for the areas of your garment that are most easily damaged, such as buttons or zippers. To help the users, the brands make available on their websites dedicated sections where they explain the procedures to repair the garments and extend their life.

The first stores start offering some garments remanufactured. However, the products available are still not enough to create entire collections, but thanks to design for remanufacturability, the processes start to become faster and smoother and the learning curve on how to manage this phase also improves. The user-recycler phase is also improving, driven by recycling. In particular, recycling activity has improved. Garments can be thrown away directly at home in dedicated bins, or the stores themselves adopt taking back policies. In addition, the products are designed for recyclability. This means, for example, that products are made using fewer fibers or use fewer chemicals in their treatments, which facilitates fiber separation and the creation of recycled yarn. Recovery phase growth is limited at this stage due to the availability of other cycles that extend the life of products. However, the improvements made in the collection of garments activity increase the volume of products that cannot be recycled and that participate in this cycle.

MID-TERM METRICS & KEY GOALS

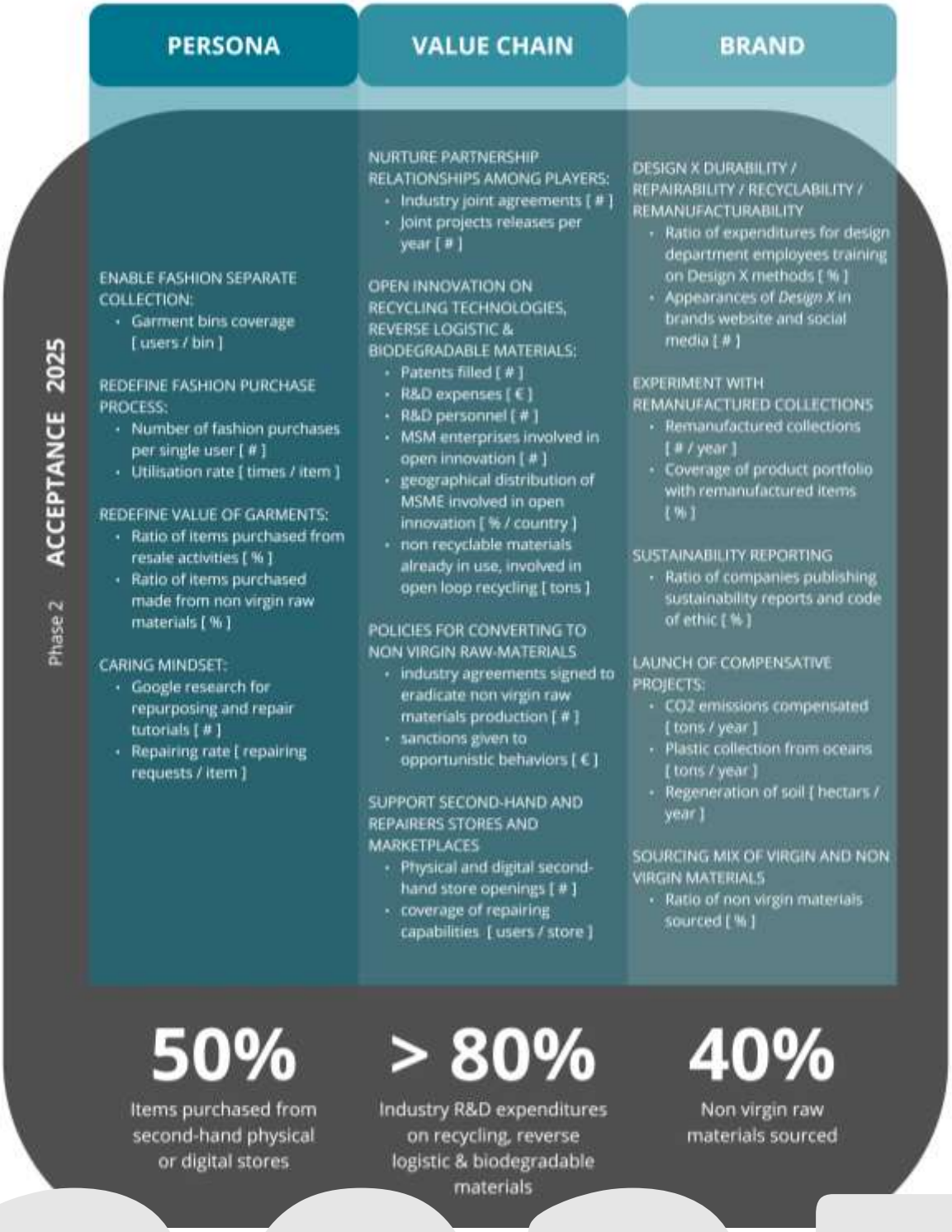

Fig. 150 – Mid-term metrics and Key goals - 2025

2025

9.3 PHASE 3: CONVERSION PHASE

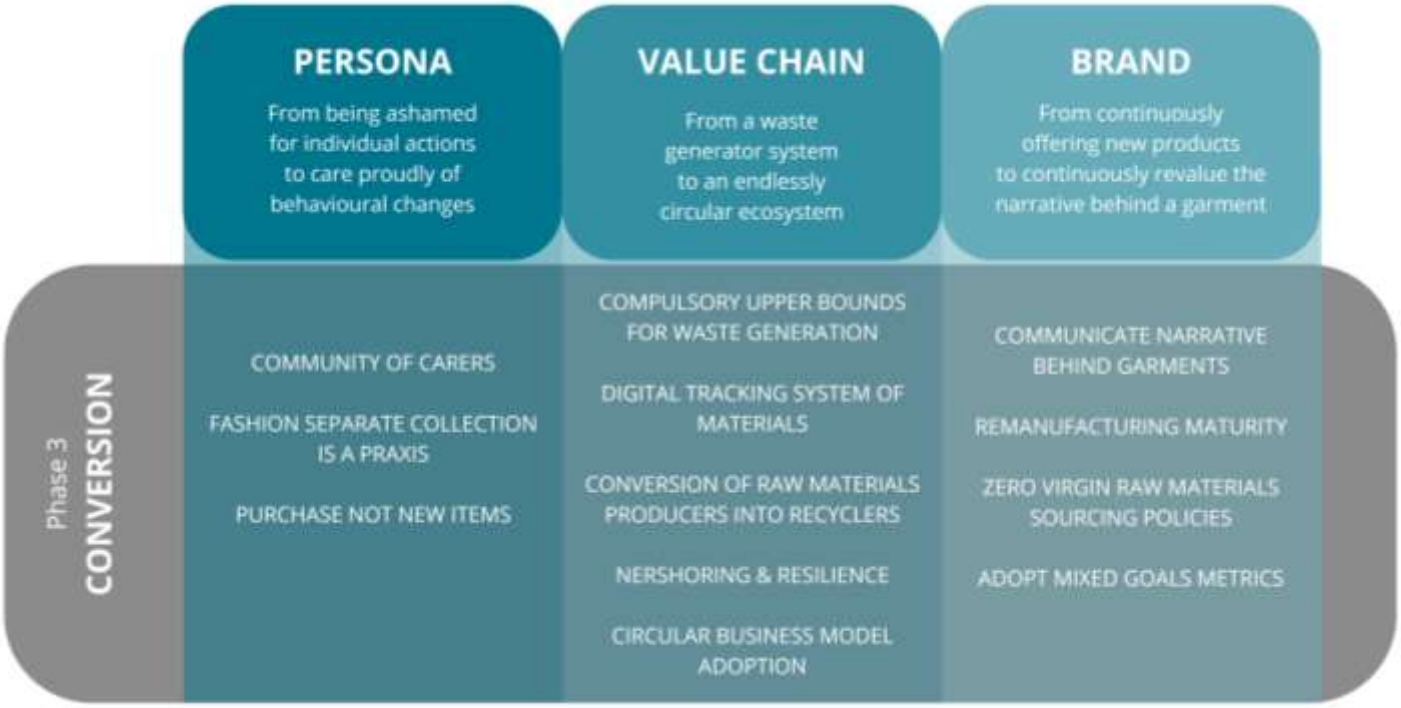

Fig. 151 – Phase 3: Conversion Phase

In the conversion phase, people start to come together driven by a common purpose which is the endless lifecycle of products, and form a community. This is a community of carers who share with each other content and advice about fashion sustainable practices. For people at this stage, the purchase of a new garment is not the main choice, they prefer to take care of it. They know how best to treat their garments. They know when to repair them, they know the services available to give a second life to their clothes. At this stage throwing away a garment is never the first option. If the garment has no chance of being repaired, they know how to recycle their clothes and fashion separate collection is a praxis

In the conversion phase, there is the achievement of a 100% circular business models adoption. The combined drastic reduction in demand for virgin materials and the increase in demand for recycled material has led raw materials producers to convert to recyclers. Their efficiency is key to minimizing waste generation. To combat this problem, digital tracking systems of materials throughout the value chain have been developed. This also makes it possible to define laws to combat waste. In addition, to tackle this issue, standard laws are also defined that the actors of the value chain must comply with, such as the set upper bounds for waste generation. To facilitate the adoption of circularity models, we no longer have to deal with a global value chain, but it has been scaled towards a model of nearshoring. This allows for greater control over the various phases of the value chain.

In the conversion phase, there is a shift in terms of communication by the brands. The objective of the brands is no longer to arrive on the market in the shortest possible time and with a fashionable product. Novelty is not the metric of choice. Instead, communication must focus on the narrative of the products in terms of garment history, what it has witnessed. Imagine wearing a garment that is partly made from a 100-year-old jacket. Remanufacturing becomes a relevant volume of production.

All brands offer product lines of remanufactured garments. Other product lines do not use virgin raw materials but only alternatives, such as fully recycled yarns or biodegradable textiles. All this also leads to a change in priorities on the part of brands. They are no longer only interested in the economic dimension, but this is balanced with the planet, people, and the caring of the products.

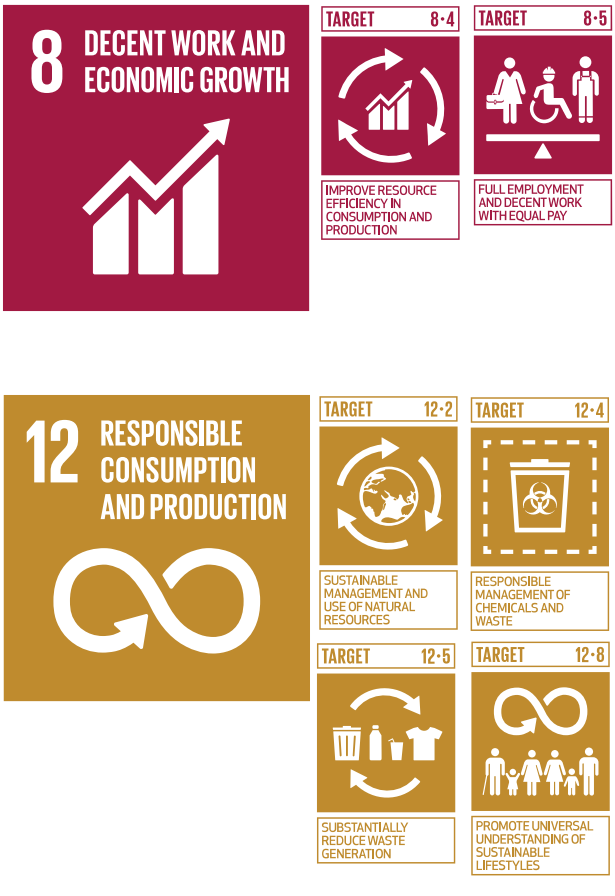

Fig. 152 – Phase 3 impacts on SGGs

In the conversion phase, the value chain has abandoned a global dimension and the production has approached the final markets, approaching a model of nearshoring. Adopting this type of solution one has shorter chains and therefore easier to control and one avoids also an overreliance on a single country. Therefore the nearshoring helps to increase the resilience and the attainment of the target 13.1.

In this phase, the circularity models have caught up to their full potential. Sustainable management and efficient use of natural resources, as per targets 12.2 and 8.4, and the creation of a system that allows for long life, optimal reuse, refurbishment, remanufacturing, and recycling, as per target 12.4, has been achieved. In addition, circular business models reduce waste generation through prevention, tracking, and reporting waste generated by type, treatment, and disposal destination, 12.5.

Moreover in the conversion phase to guarantee the full circularity of the system it has been necessary the complete conversion of the raw materials producers into the recycler. The retraining of workers, in a more challenging environment and with an adequate salary, has also led to the achievement of target 8.5.

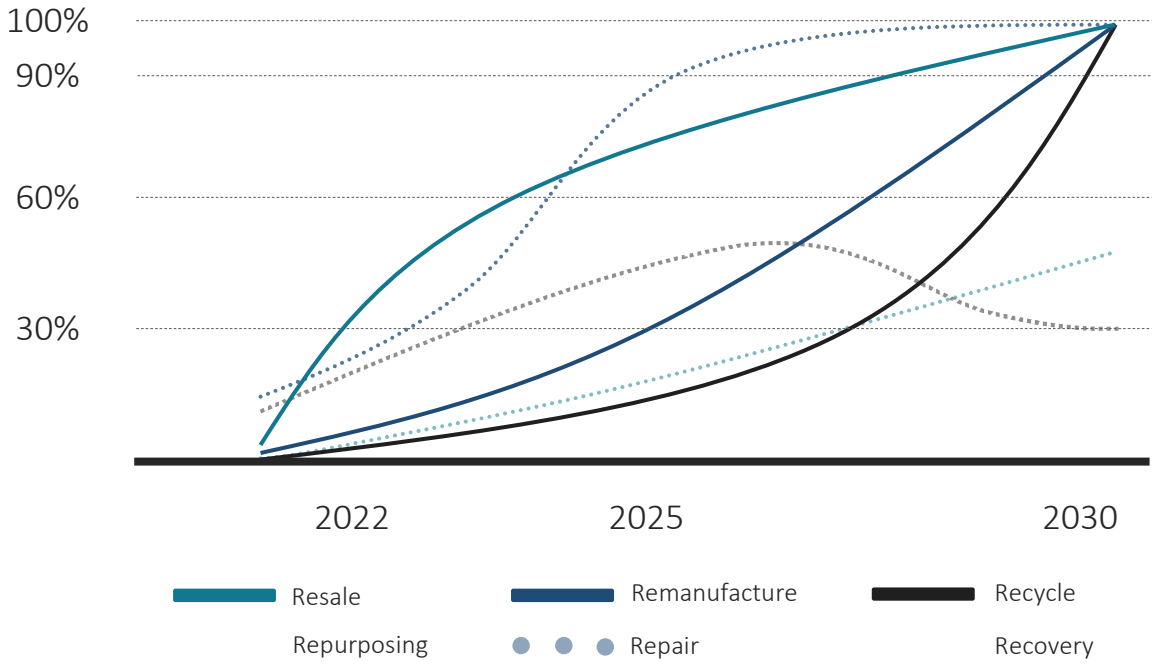

Fig. 153 – Phase 3 Conversion phase, three cylces

In the conversion phase, the user-user cycle continues to have an almost linear growth. Resale continues to increase its relevance thanks to the mechanisms for collecting products that are now consolidated. For example through the possibility of home picks or throughout non-store collection points. All these solutions have improved the accessibility of the service and its diffusion. In the conversion phase, there is finally a community of carers that helps the repurposing phase. People who have become attached to some of their garments, now no longer usable, can give them a second life using the advice and content shared by the community and transform my garments into new products, such as bags or backpacks. However, there are many alternative cycles and the repurposing phase remains more like a recreational activity. In the user-brand cycle, we find the repair phase, which is now an established service, and in the consolidation phase, the number of brands adopting this service simply increases.

Remanufacture is growing exponentially driven by customer demand. In fact, customers are no longer looking for novelty in garments, but rather for the story behind them. Inside the stores, we find areas dedicated to remanufactured products. In the user-recycler phase, the full potential of recycling activities has almost been reached. Collection schemes have expanded and customers know how to recycle products, and help in the initial stages by removing parts that cannot be recycled, such as hinges. In addition, all products are equipped with RFID technologies, to facilitate identification and sorting. The plants can process large volumes of material and can supply all subsequent stages. The recovery, having reached its peak in the previous phase, begins a downward trend. The products that enter this cycle are those that were manufactured before the education phase. All newly produced garments are made to be either totally recyclable or totally biodegradable and therefore this phase decreases its relevance and is expected to reach zero.

LONG-TERM METRICS & KEY GOALS

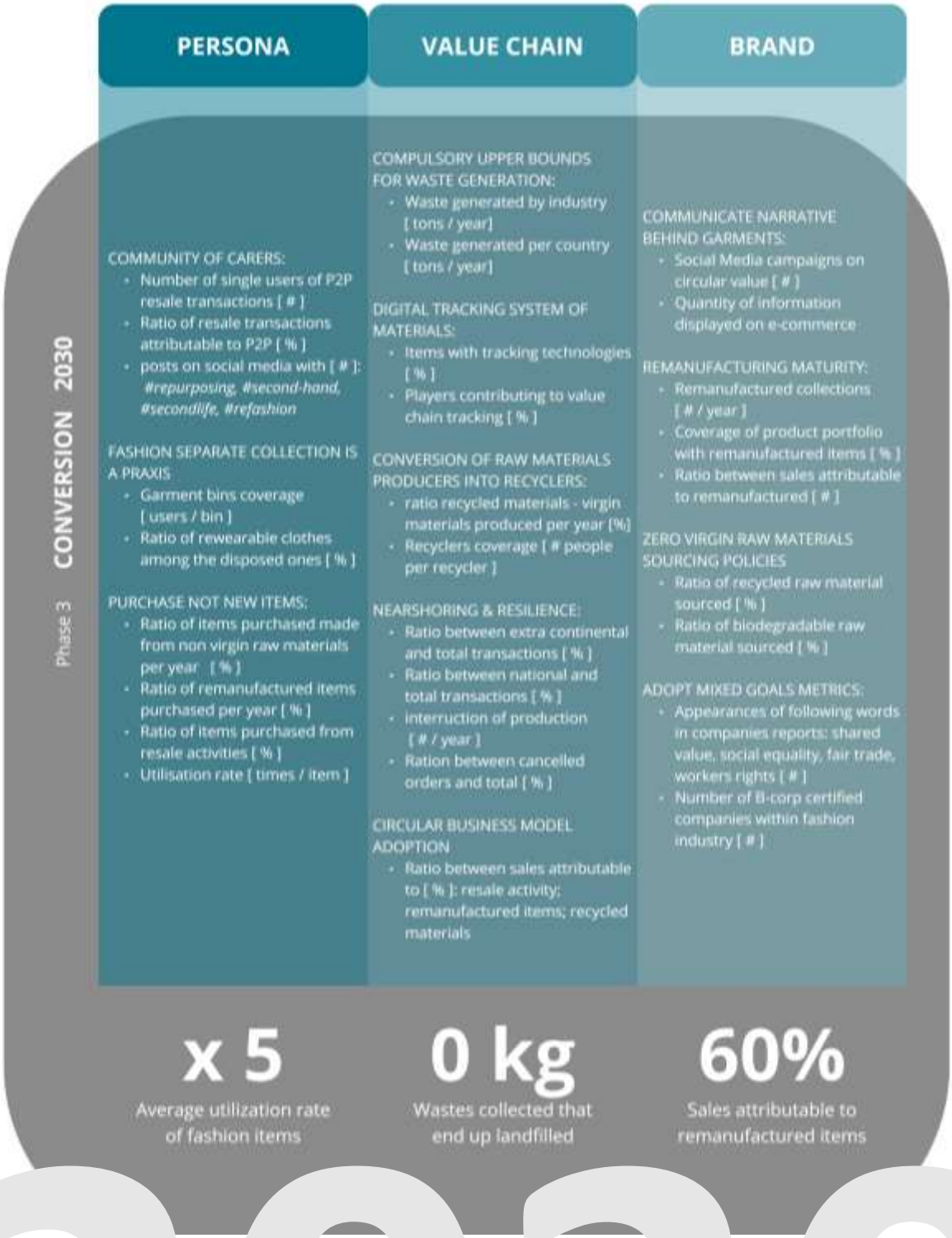

Fig. 154 – Mid-term metrics and Key goals - 2030

PART III

CONCLUSIONS & NEXT STUDIES

10.

10.1 **IT'S** TIME FOR A CHANGE

Today's world is shaken by extreme tensions, both of a social nature, due to increasing inequality, and to climate change issues, where decades-long neglect of climate change and exploitation of natural resources have devastated our planet. In 2019, the outbreak of the Covid-19 pandemic, brought even more drastic impacts. Apart from the sanitary emergency, the pandemic resulted in a severe economic crisis, among the worst shocks in our history. From the supply side, shocks hit harsher in case industries were classified as non - essentials and mansions are generally not suitable for remote working. Instead, from the demand side, shocks were a combination of reduced spending power, with psychological and contextual factors. Moreover, the pandemic crisis has exasperated even more the structural inequalities and deep discriminations that constitute our society, globally, regionally, and locally. This led to the awakening of social consciousness, particularly among the younger generations of Millennials and Gen Z. An enabler of this phenomenon has been the digital acceleration due to the pandemic restrictions. Information inequalities reduced and these generations have become very conscious of what happens every day in our world. Especially the Gen Z is moved by a spirit of rebellion and do not sit on the sidelines. We can define them as a generation of activists, and they have brought activism where they feel most comfortable, online. Protests target institutions and multinational companies that are considered as the real culprits that take advantage from world inequities. They expect companies to take a stand and demonstrate with facts their commitment. For them consumption is a matter of ethical concerns, not of accumulation. They need to be engaged and need to trust brands and organizations. The impetus brought by Covid-19 along with the growing pressures from the younger generations is an opportunity that must not be wasted to transform businesses and respond to a deep sense of purpose. People demand an abandonment of profit as the dominant logic to embrace a broader and more ethical perspective on the role that business play in our society. Global value chains, that have been the dominant model for decades, are not accepted anymore. Their complex nature, made up of numerous processes and large networks of economic agents distributed throughout the world, makes it extremely difficult to control the various production processes and actors involved. In accordance with these trends, we have witnessed the explosion of B-corps as well as the accelerating adoption of nearshoring strategies.

The impetus brought by Covid-19 along with the growing pressures from the younger generations is an opportunity that must not be wasted to transform businesses and respond to a deep sense of purpose.

We can say that is the right time for undergoing a major transition and we, as management engineering students, with a foot in the working environment, want to gift our contribution. Indeed, transformative innovation is a matter of leadership, and business managers, being the conductors of the powerful economic force, ought to behave as leaders of the transformations that our society and our planet desperately need. With our thesis, we contribute to identifying and understanding how to make the most of this change that is taking place, and in particular we have chosen to focus on the fashion industry.

10.2 TRANSFORMING FASHION

We are passionate about fashion because it has the power of communicating our emotions to the outside world through the choice of designs, colors, symbols, materials. This power that fashion has to shape our society, values, and habits is fascinating and is one of the reasons we decided to study this industry. Fashion stands as the mirror of our society, it is the narratives of our costumes and beliefs, it communicates ideas, takes sides on social and political issues, and breaks the settled schemes continuously. It is a transformative force that molds our world by acting on a blurred boundary between art and cultural heritage, revising continuously traditions with fresh ideas. Besides its transformative power, the fashion industry, with its global value chains made of numerous processes and large networks of economic agents, is a complex system with extensive margins for improvements. Despite its innate innovative drive, the actual industry organization shows numerous and harsh unbalances, both from an ethical and environmental point of view. In fact, fashion has broken its pure artistic soul, becoming in recent years synonymous with consumerism; one of the causes has been the affirmation of the fast fashion model. This model, based on a very wide range of products with low price, has provoked in the clients a change in their behavior, increase in product consumption and at the same time a drastic reduction in their use. The result of all this has been an immoderate increase in production and the creation of tons of fashion wastes that have simply been landfilled every year. Globally distributed supply chains exploit unethically the unbalances of our world, producing many negative externalities, especially for workers in the early stages of the value chain, and widening more and more the existing social gaps, rather than fighting them. Production has been relocated to developing countries, especially in South-Asia, where workers are often exploited, paid with a minimum wage that can be even one-fifth of a living wage. Obviously, the main objective of this model is to reduce prices, at the expense of everything, including the environment.

As a result, the fashion industry is reported to be the second most polluting industry after oil (Charpail, 2017). The industry uses up to 44 trillion liters of water annually (Gabi, 2018), apart from the water polluted using chemicals in manufacturing and finishing processes. It is the main source of microplastics released in the ocean, being responsible for 35% of them (Wagner, 2020). Lastly, chemicals represent another relevant threat to both terrestrial and freshwater ecosystems since it is estimated that over 15 000 different chemicals are used during the production of fashion items (Roos et Al. 2019). As we have seen, Covid-19 showed the weaknesses and inequalities of the current system and triggered a social awakening in the population. All of this has increased the pressure on companies that need radical change in order to better face the future. A future that, as covid has shown, is increasingly difficult to predict and extremely uncertain. Therefore, we need guidance in this uncertain moment so that this opportunity for change is not wasted. This is what we do in our research.

Despite its innate innovative drive, the actual industry organization shows numerous and harsh unbalances, both from an ethical and environmental point of view. In fact, fashion has broken its pure artistic soul, becoming in recent years synonymous with consumerism

We want to give our contribution in envisioning future perspectives and a transition pathway that could concretely lead fashion companies out of the tremendous actual situation. So firstly, we have identified three different scenarios and then we have chosen our preferred one. The scenarios described are realities in which certain aspects are taken to extremes. The reason for this is to encourage dialogue about the main themes of the different scenarios so that brands can ask themselves how they can adapt to the different situations.

Scenarios Building

The first scenario is *Digital Immersion*, in which the digital pervades every aspect of reality and in which everything, included fashion, is or can be done in a virtual world. The second one *Endless Caring* in which climate crisis has reached his peak and where fashion, being one of the least environmentally sustainable industries, must undergo a radical transformation, leaving the dominant linear model of production in favor of circular businesses. The third one, *Fashion Activism*, is characterized by a world that is pervaded with social tensions and the fashion industry, being among the least sustainable, has undergone a disruption of the value chain, with the abandonment of a global value chain and the adoption of onshoring strategy, to gain more control and transparency along the value chain.

Preferred Future Identification

The preferred future is chosen not in terms of likelihood, but rather is an emotional, subjective evaluation. Nevertheless, if this choice has a subjective nature, we wanted to have a clear view on strengths and weaknesses of the three scenarios in terms of sustainability enhancement of the fashion industry. In the comparison of the three scenarios, our choice fell on the second one: Endless Caring. Indeed, the compatibility of this scenario with Sustainable Development Goals is promising. SDG 12 and SDG 13 are significantly achieved by Endless Caring scenario since it is the only scenario that considers all the targets of which these two SDGs are composed of. As regards SDG 8, only the Fashion Activism scenario outperform Endless Caring, since it is focused on the social issues. Moreover, Endless Caring is the least disruptive both from a value chain point of view, which remains global and similar to the current situation, and from a product point of view, which continues to be physical. Endless Caring also mitigates the negative impacts on workers, since the disrupted jobs can be more easily reallocated in the new value chain; avoiding the resistance of workers to this transition. Finally, from a technological standpoint, this scenario leverage on technologies which have almost reached their maturity.

Our preferred future is Endless Caring. Indeed, the compatibility of this scenario with Sustainable Development Goals is promising, it is the least disruptive in terms of value chain, and mitigates the negative impacts on workers, avoiding in this way workers and incumbents resistance.

Designing a Transition

Once the preferred future was identified, the next step was backcasting. The aim of the process is to project back long-term visions of desired futures until the present, creating a transition pathway in which projects become steps in this transition. To support the transition, three distinct phases have been identified in which incremental actions must be performed in the person, value chain and brand categories, which are the same as those that were used to develop the scenarios.

The first phase is the *Education* phase, which must be implemented by 2022, and focuses on raising awareness around problems and propose the Endless Caring paradigm. The persona is educated about unsustainability of the current fashion system and on the impacts that are attributable to the affirmation of fast fashion. They also realize that from starting from their daily behaviors, users have a serious impact and drive radical industry transformations. Value chain is educated with a focus on waste and end-of-life management and Endless Caring value chain is proposed, introducing the concepts of endless circularity and all the complementing cycles that need to be started. Brands need to become aware of their responsibility choices, which determine most environmental impacts of products. Brand responsibility does not finish with the product selling but it is to extend also to the use phase and the end-of-life, through repairing and recycling.

The second phase is the *Activation* phase that must be implemented by 2025, which activate the immediate steps and enable the development of more complex ones. The persona begins the first steps towards circularity models by mainly a change in mindset, redefining the process of purchase. They are not interested anymore in a type of fashion quick and impulsive but evaluate carefully their purchases because they want to enjoy products for a long-time, which never lose its value but is always ready to get a new purpose through one of the different circular options available. Value chain players are moving away from transactional approaches and embrace deep relationship models. They are open to collaboration and use open innovation paradigm to find the scale up recycling technologies and new solutions for reverse logistics. There is a focus on new types of materials to be used as alternatives to the virgin ones. Brands in this phase adopt new types of design so that new garments start to fit within the endless cycles. There is the emerge of Design X Durability, Repairability, Recyclability and Remanufacturability. Brands should also make an available environmental report. All these starts paving the way for transparent and trustworthy communication with users and stakeholders.

The last phase is the *Conversion* phase to be implemented by 2030, where the full potentiality of Endless Caring realized. People start to come together driven by a common purpose which is the endless lifecycle of products and form a community. For people at this stage, the purchase of a new garment is not the main choice, they prefer to take care of it. As regard the value chain, there is the achievement of a 100% circular business models adoption, with a drastic reduction of virgin materials and minimization of waste generation. Furthermore, we no longer have to deal with a global value chain, but it has been scaled towards a model of nearshoring. This allows for greater control over the various phases of the value chain. There is a shift in terms of communication by the brands. The objective of the brands is no longer to arrive in the market with the shortest possible time and with a fashionable product. Novelty is not the metric of choice. Instead, communication must focus on the narrative of the products in terms of garment history. All brands offer product lines of remanufactured garments.

The first phase is the *Education* phase, which must be implemented by 2022, and focuses on raising awareness around problems and propose the Endless Caring paradigm.
The second phase is the *Activation* phase that must be implemented by 2025, which activate the immediate steps and enable the development of more complex ones.
The last phase is the *Conversion* phase to be implemented by 2030, where the full potentiality of Endless Caring realized.

To synthetize the Endless Caring paradigm, we can describe its main feature, circularity. User-User cycle includes the Resale and Repurposing activities, which happen among users. User-Brand cycle, with the Remanufacturing and Repairing processes, and finally User-Recycler, where we find Recycle and Recovery. The cycles that from the earliest stage of the transition already manage to grow exponentially, are resale and repair. The first one is a service that is already rapidly expanding today. However, it has not yet reached its full potential due to a reverse logistic that has not yet reached full efficiency and the low availability and accessibility. In the acceptance phase it will continue to prosper, thanks to clients who, in the purchasing phase, also consider the impact that a garment has on the environment. The second-hand product increases its value in the eyes of the persona. Repair phase has already begun to take off, especially for the ease of adoption and the impact it has on customer retention. Since the education phase, this offering is being integrated by many brands into their services.

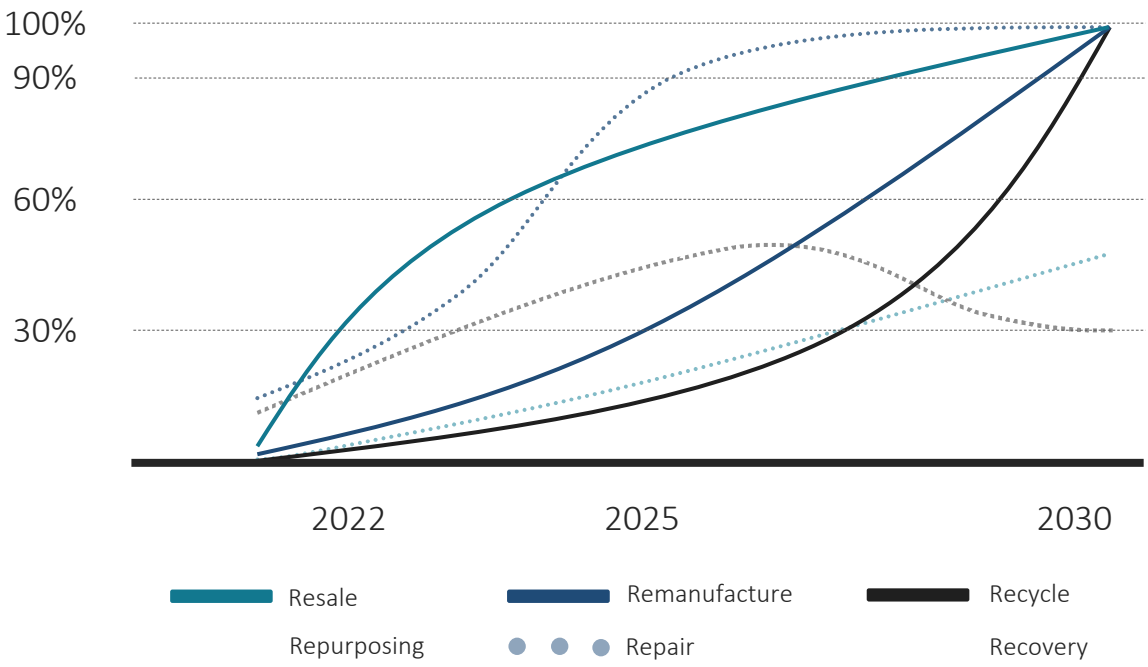

Fig. 155: Cycles progression along the transition

This phase will have a slight increase also in the successive phases thanks to the repairing kit provided by the brands progressively in the moment of the purchase. The other cycles, on the other hand, considerably increase their use after the activation phase. If we consider Remanufacting as an example, it will face initial difficulty in spreading, because of the absence of production standards and therefore each product is assembled and undergo different treatments. In the second phase we begin to see the first collections of these products, but it is in the next phase that they reach their full potential, with growing exponentially driven by customer demand. In fact, customers are no longer looking for novelty in garments, but rather for the story behind them, with entire product lines dedicated to remanufactured products. As for recycling, similarly to the case of remanufacturing, the initial difficulties are due to the vast number of different products that have undergone different processes and are therefore difficult to recycle. It is in the last phase that it reaches its full development thanks to the development and implementation of Design for Recyclability principles. Moreover, customers know how to recycle products, and help in the initial stages by removing parts that cannot be recycled, such as hinges.

In addition, all products could be equipped with RFID technologies, to facilitate identification and sorting. The repurposing cycle develops after the second phase, thanks to the presence community of carers that helps the repurposing activities. However, this phase does not get its total development, because there are many alternative cycles, and the repurposing phase remains more like a recreational activity. Different from all the other phases is the Recovery phase, which reaches a peak in the acceptance phase and then decreases in the following phases. The initial growth can be attributed to open-loop activities to the materials that were already in use and to the improvements made in the collection of garments activity increase the volume of products that cannot be recycled and that participate in this cycle. The recovery, having reached its peak in the previous phase, begins a downward trend. The products that enter this cycle are those that were manufactured before the education phase. All newly produced garments are made to be either totally recyclable or totally biodegradable and therefore this phase decreases its relevance. Once the transition is designed, we also proposed two maps for the mid- and long-term (pp.), with the aim of providing more tangible goals and key objectives, which we believe are critical to achieve.

10.3 LIMITATIONS & FURTHER STUDIES

Notwithstanding our attempt to provide contributions for theory and practice, we are aware of the limitations of our study. A first problem derives from the choice of the topic to be dealt which embraces a large focus on the entire fashion industry. This topic is extremely broad and moreover the fashion industry is a very complex sector. For this reason, we have adopted an interdisciplinary approach, integrating our Engineering background with that of Design. This led to an increase in the complexity of this thesis, also because for the first time we were dealing with such a large project, and with this kind of methodology. Clearly, our research deviates from a typical empirical thesis, where first-hand data and analysis is of paramount importance. Our methodology was based instead on the Foresight Framework developed by Voros (2003) because not only it summarizes previous versions of foresight processes, but also, he clarified the role of foresight within organizational boundaries. Indeed, foresight is an aspect of strategic thinking, concerned with exploration and options creation, based on patchy information. It differs from strategic planning, which is instead an analytical way of breaking down goals of intentions into steps, formalized, and implemented. But rather than foresight being a separate and episodic occurrence, Voros sees it as an integrative part of the strategy development and planning. Foresight outputs become inputs for following strategy development and planning. And it is precisely in this area that we have positioned ourselves with our thesis. In fact, our contribution is useful because our output becomes an input for strategy development and planning, for the various actors of the fashion industry. For this reason, in our approach we relied on qualitative enquiry rather than a quantitative approach. Specifically, the inputs were signals. Signals are the basic building block of any future thinking effort. They are tools to see in the dark of the future and trigger some questions about the future which may help us avoid future shocks. Signals of the future are already around us today. A signal can be anything: a technology, a product, a service, an experience, an anecdote, a personal observation, a research project, or a report. Therefore, from the very beginning we approached our thesis with a future mindset, searching for these signals in the world around us, both in reality and in all the documents we consulted. For this reason, to write the literature review we consulted many websites and reports from different sources, but we did not collect first-hand data, which would be very difficult to collect so that they were very meaningful. However, in the following phase of validation of the results obtained, a first-hand data approach would have been valuable, such as with focus group or Delphi method, to verify the results obtained with a panel of experts of the industry. Moreover, given the subjective nature of our work, anyone who approaches this methodology, can collect signals and make considerations that may lead to different perspectives from ours. Nevertheless, different visions that may arise in the future would not demolish our contribution, but rather would enrich the dialogue around future of fashion, which is exactly the right approach of future studies. A final consideration relates to the transition proposed; in fact, to enable a change it is necessary to be able to measure it, so it was essential to provide metrics and main goals to pursue. We tried to reason as much as possible at all the possible implications, but some perspectives might have not been considered.

As for the future studies, as mentioned briefly we expect further works on this same topic, that will enlarge the dialogue on future fashion. Indeed, the process we followed itself is highly iterative since along the transition reigniting the process would mean apply corrections and perfection the outputs. Interest dimensions of future analysis could be about the evolution of technologies that enable Endless Caring cycles, the response of people along the transition phases, and particularly paying attention to the youngest Gen Alpha which will bring a new wave of change.

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