



Environmental Footprints and Eco-design of Products and Processes

Series Editor

Subramanian Senthilkannan Muthu, Head of Sustainability - SgT Group and API,
Hong Kong, Kowloon, Hong Kong



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22 Miguel Gardetti · Ivan Coste-Manière
23 Editors

24 Sustainable Luxury
25 and Craftsmanship
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Ivan Coste-Manière
Luxury and Fashion Management
SKEMA Business School
Sophia Antipolis, France

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Preface

70 Several authors have asserted that one of the luxury basics is high quality and savoir
71 faire,¹ being the latter related to the craftsmanship of handmade products resulting
72 from a knowledgeable elite of artisans who have preserved unique manufacturing
73 traditions, enabling companies to continuously deliver top-quality products. The
74 importance of craftsmanship in the luxury world should not be ignored. It was the
75 main reason because some organizations developed important activities related to
76 the craftsmanship in the luxury sector. The time factor is inherent to quality.
77 Moreover, the relationship between luxury and quality makes most luxury products
78 to be seen by luxury consumers as high price, not readily affordable and, some-
79 times, snobbish products. But quality is also related to unique raw materials or
80 production processes in specific geographic areas. There is no such a thing as
81 luxury without quality—which is its essence. Quality and craftsmanship of these
82 iconic items help them remain desirable generation by generation, providing them a
83 sense of timelessness. Besides, sustainable luxury would not only be the vehicle for
84 more respect for the environment and social development, but it will also be syn-
85 onym of culture, art, and innovation of different nationalities, maintaining the
86 legacy of local craftsmanship. This volume² gives a comprehensive outlook about
87 this subject and begins with the work titled “[Jewellery Between Product and](#)
88 [Experience: Luxury in the Twenty-First Century](#)” by Prof. Alba Cappellieri,
89 Prof. Livia Tenuta, and Dr. Susanna Testa. In this chapter, they analyse through
90 case studies the different ways for the jewellery sector to promote a sustainable
91 practice. It presents the opportunities and risks of progress on technological and
92 digital innovation for the competitiveness of companies in both production pro-
93 cesses and also explores communication tools.

¹This is related to **aesthetics and beauty**: The combination of aesthetics, beauty, craftsmanship, and quality is very hard to find outside the luxury market.

²This volume is an effort of the **Global Center on Sustainable Luxury**, created by the agreement between **SKEMA Business School** (France) and **the Center for Studies on Sustainable Luxury** (Argentina) on 24 July 2018.



94 The following chapter, “[Sustainable Luxury, Craftsmanship and Vicuna Poncho](#)”,
95 written by Roxana Amarilla, Miguel Gardetti, and Marisa Gabriel, explores the
96 theoretical framework to subsequently delve into the Vicuña Poncho universe. It
97 offers a description of both this object, highlighting its historic and current symbol-
98 ogy, and the ancient aboriginal practices still used by artisans, to conclude with
99 thoughts about the importance of sustainable luxury and the appreciation of the
100 Vicuña Poncho to empower artisans and expand their horizons.

101 Then, Alba Cappellieri develops the chapter titled “[Unwritten: The Implicit
102 Luxury](#)”. It describes and analyses how ancestral communities developed unwritten
103 languages through textiles and how understanding, engaging with, and preserving
104 the dynamic they used can help us connect with others in the deepest way. It
105 explores its potentials to be considered a new form of luxury, one that is no longer
106 about buying things but about understanding and reacting to the needs of both
107 people and the environment in a holistic way.

108 Subsequently, the purpose of Matteo De Angelis, Cesare Amatulli, and
109 Margherita Zaretti’s work “[The Artification of Luxury: How Art Can Affect
110 Perceived Durability and Purchase Intention of Luxury Products](#)” is to present and
111 explore the idea of associating luxury products and brands with the concept of art
112 and artworks might help luxury companies tackle “democratization” of luxury, their
113 need to reinforce aesthetic, moral and symbolic value, and the growing consumers’
114 concern about the social and environmental impact that luxury brands’ activities
115 bring forth.

116 Moving on to the next chapter, “[Lasting Luxury: Arts and Crafts with Xia Bu 夏布,
117 a Traditional Hand Loomed Ramie Fabric](#)”, the author, Ying Luo, present ramie and
118 traditional craftsmanship techniques, for example, on a woman’s clothing piece from
119 Han Dynasty (206 BC–220 AD) made from natural fibre and no colour. This chapter
120 analyses ramie fibre, presents its characteristics, and explores its potential as luxury
121 fibre emphasizing on artisan techniques.

122 The following chapter entitled, “[Luxury Craftsmanship as an Alternative to
123 Building Social Fabric and Preserving Ancestral Knowledge: A Look at Colombia](#)”,
124 by Alejandra Ospina and Ana López, explores the strong link between handicrafts
125 and luxury, and between creators and creations, and the value of generating
126 products with personal history and durability over time. Sustainability, luxury, and
127 ethics initiate a permanent and unalterable dialogue in the reconfiguration of the
128 fashion system. This dialogue allows addressing in a meaningful manner the crea-
129 tion of pieces aligned with responsible processes allowing environmental and
130 social balance in a society where luxury cannot exist without sustainability.

131 Finally, Annete Condello in the chapter entitled “[Crafting Luxury with ‘More-ish’
132 Qualities at the YSL Museum: An Organic Approach](#)” analyses the “more-ish”
133 qualities, defined herein as causing one’s impulse to create *handsome* foci (as opposed
134 to the Moorish, which is culturally based), inherent in the YSL Museum from an art-
135 architectural perspective within the sustainable luxury context. It discusses how
136 traditional bricklaying techniques and their unexpected connections have transformed



137 the desert-built environment and speculates why these changes inform adaptive reuse
138 practice as a “more-ish” organic approach. In this respect, in discussing the brick-
139 making as a form of crafting luxury the process has cultivated a bonding or
140 “tuning-in” tactic, important in understanding sustainable Moroccan culture.

AQ3

143 Buenos Aires, Argentina
144 Sophia Antipolis, France
146

Miguel Gardetti
Ivan Coste-Manière



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About the Editors

177 **Dr. Miguel Gardetti** was Renowned Professor at different Latin American
178 universities and participated as both Trainer and Instructor in projects of the
179 Inter-American Development Bank. He founded—in 2010—the Centre for Study of
180 Sustainable Luxury, first initiative of its kind in the world with an academic/research
181 profile. He is also Founder and Director of the “Award for Sustainable Luxury in
182 Latin America”. For his contributions in this field, he was granted the “Sustainable
183 Leadership Award (academic category),” in February 2015 in Mumbai (India). He is
184 Active Member of the UN Global Compact in Argentina.

185
186 **Dr. Ivan Coste-Manière** is Programme Director of Luxury and Fashion
187 Management at SKEMA Business School. His specialties include marketing,
188 communication, and international luxury goods management. He has managed the
189 R&D of several multinational groups and founded several companies in the areas of
190 cosmetics and perfumes, luxury goods, PR and events, and pharmaceuticals. He has
191 been Section Member of the French Economic and Social Council and Deputy
192 Mayor of the city of Grasse for ten years. He has been President, with Prince
193 Albert II of Monaco, of the Track and Field Association: Celebrities for Sports and
194 Charities, while co-chairing the Center for Sustainable Luxury, and works as a
195 consultant for several well-known luxury brands. He holds a Ph.D. in chemistry, is
196 Engineer of the Ecole Centrale Marseille, and has been awarded the Gold Medal
197 (Ministry of Youth and Sports) and the Officer des Palmes Académiques Medal by
198 the Ministry of Research and Education. He is Member of the Economic, Social and
199 Environmental Council Region Sud, of the board of the Comité Français Pierre de
200 Coubertin, Vice President of the Association Francophone des Académies
201 Olympiques, and a distinguished speaker in numerous countries and prestigious
202 institutions and conferences.
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Jewellery Between Product and Experience: Luxury in the Twenty-First Century



Alba Cappellieri, Livia Tenuta, and Susanna Testa

Abstract In the contemporary scene, identifying a common and shared definition of what luxury means is ever more difficult and daring. The concept of luxury has changed over time. For centuries, luxury was intended as a sum of beauty and high quality pursued by hand-work and linked to physical products. The digital revolution and the widespread of Information and Communication Technologies has had a significant impact on the global productive system, marking a transition from an ‘analogue’ era to a digital one—and now ‘post-digital’. The paper focuses its investigation in particular on the relationship among jewellery, luxury and sustainability. Firstly, the contribution analyses the concept of luxury and shows how this is increasingly linked to intangible values, where the preciousness of materials has shifted to the preciousness of values. Intangible, far from the needs but close to the desires and dreams of each individual, luxury is seen as the ability to translate the essence of one’s time into a product. The examination then focuses on the jewellery field, as one of the most important luxury goods due to its inherent uniqueness and exclusiveness. The entire essay starts from the assumption that giving a univocal definition of jewellery is impossible because of its value and meaning change according to the contexts. Jewellery, as well as luxury, is highly defined by the temporal variable and by the contexts. Today materials are no longer the only characterizing element to define if a jewellery item belongs to the sphere of luxury. Materials and techniques are instead design choices, useful to tell a story. For this reason, the paper takes into consideration examples of high-end jewellery as well as independent brands and designers who use non-traditional materials for their production. The paper identifies as one of the most important value able to represent the contemporaneity the need of awareness. Luxury should tell about excellence, and luxury products stained by the burden of the environmental or social burden cannot be considered as exclusive or desirable. Environmental and social awareness cannot but be part of the production and distribution strategies of companies in the sector. The essay analyses through case studies the different ways for the jewellery sector to promote a sustainable practice. In detail, the first significant grafts for a sustainable supply chain are taken into

A. Cappellieri · L. Tenuta · S. Testa (✉)
Politecnico Di Milano, Milan, Italy
e-mail: susanna.testa@polimi.it

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consideration, respecting tradition and the *genius loci*, the environment and people. Subsequently, the opportunities and risks of progress and technological and digital innovation for the competitiveness of companies in both production processes and lastly communication tools are explored.

1 Luxury: From Preciousness to Awareness

Là, tout n'est qu'ordre et beauté./Luxe, calme et volupté
There, all is order and beauty./Luxury, peace and pleasure
Baudelaire, L'invitation au voyage

The concept of luxury has changed over time. For centuries, luxury was intended as a state of great comfort or elegance, especially when involving great expense or an inessential, desirable item which is expensive or difficult to obtain (Oxford Dictionary).

However, this definition of luxury is obsolete or, to be more precise, it is only a mirror of a part of modern society devoted to the convenience and the functionality able to see beauty only in the ephemeral and able to see luxury in what is expensive and opulent. Another part of society, cultured and educated in the knowledge of beauty, recognizes luxury as a life experience, as a result of identity.

The controversy in the definition of what is luxury today already lies in the etymology of the word itself. On the one hand, it refers to the Latin word *lux* that means light. Therefore, something that illuminates, makes visible and understandable, both in terms of logic but also in terms of ethics and aesthetics. So a fully positive meaning, in which luxury is a glorious goal of elevation of status. On the other hand, luxury, from the Latin word *luxus* 'superabundance, excess in the way of life'. Therefore synonymous of superfluous, useless, excess.

These are the two sides of luxury: on the one hand, intuition of beauty and intelligence, and on the other hand, vulgarity and degeneration.

The modern meaning of luxury according to Karaosman [9] dates back to the end of the nineteenth century, when, satisfied with the primary physiological needs—those that Maslow [11] inserted at the base of the pyramid of the hierarchy of needs, luxury was associated with some factors linked to limited stocks, human intervention and value identification. At the beginning of the last century, in addition to functionality, quality, durability and performance, luxury guaranteed a symbolic and experiential value, transcended mere physicality and was characterized by some essential features such as high quality, craftsmanship, exclusivity, uniqueness, provenance, technical performance and the creation of a lifestyle. Some examples are the Mont Blanc pen from 1906 or the Rolex watch from 1908.

Since the mid-twentieth century, technological innovation has triggered changes that have produced economic development and widespread social progress. The third industrial revolution and the economic boom in the 1960s had an impact on the democratization of luxury goods. The democratization of luxury has translated

into greater offer and compulsive consumption. This led to the widespread of the so-called Luxury for the Masses [14], and the brands of the sector have expanded their production by inserting more and more ‘masstige products’.¹

Not surprisingly, however, alongside the accessible and widespread luxury, the 1960s are also the years of the first sensational ecological complaints: the American biologist Rachel Carson in her essay *Silent Spring* [5] showed great concern for the environmental disaster of the last two hundred years, a disaster that will be perpetuated up to the present days. Today’s industrial systems, focused on mass production and consumption, have in fact caused an increase in human influence on natural phenomena. Luxury brands offer authentic, excellent and enticing products based on rare and high-quality materials. Yet the raw materials are derived from natural systems constantly influenced by the effects of climate change such as drought, loss of biodiversity and social issues such as lack of skills, loss of employment and health and safety problems.

The changes brought about by industrial revolutions have affected not only the environment, society and consumption trends, but also the concept of jewellery itself. We are witnessing a process products globalization, in which even jewellery, through the reinforcement of the power of the brand, progressively loses its link with the territory in which it is created. The digital shift of the 2000s marked the disruption of industrial production with repercussions on typical territorial districts, with the risk of losing knowledge and know-how linked to traditional craftsmanship.

So, in which direction is luxury going today? And what are the driving factors?

To answer these questions it is worth, first of all, narrowing the field, not talking generically about luxury goods but identifying a specific category. The essay will examine the jewellery field. Throughout history, jewellery has been one of the important luxury goods due to its uniqueness and exclusiveness.

Jewellery, as well as luxury, has over time been the subject of twofold, or rather multiple, interpretations.

Historically, jewellery has always been a land of art, craftsmanship and design. Ambiguous objects with contrasting values, from unbridled luxury to conceptual avant-garde, from the dazzling preciousness of materials to more or less latent design values. On the one hand, art, with the arrogance of its authorship, on the other, fashion, with the transience of its present, in the middle of the jewel with the defence of precious materials as bastions of eternity.

If for a long time the value of a jewel has been synonymous with preciousness, and therefore the physical cost of the material, today this idea is definitely outdated and the value of a jewel—as well as an accessory or a product—is the story of everything behind the scenes. It is the result of the quality of the project, the ability of the designer or artist to generate a storytelling around the object thanks to the formal, material or technological choices and production techniques.

¹Masstige is a marketing term meaning downward brand extension, literally ‘prestige for the masses’. The term was popularized by Michael Silverstein and Neil Fiske in their book *Trading Up* and Harvard Business Review article ‘Luxury for the Masses’. Masstige products are ‘premium but attainable’. These are considered luxury or premium products, and they have price points that fill the gap between mid-market and super premium.

Luxury is intangible, far from the needs but close to the desires and dreams of each individual. It is the ability to translate the essence of one's time into a product.

And the materials, the tangible preciousness of the piece, is no longer the only characterizing element to define if an object belongs or not to the sphere of luxury. The material, regardless of whether it is gold, diamonds or wood, is a design choice. Materials and techniques are a means to tell a story. The following chapters will take into consideration examples of high-end jewellery as well as independent brands and designers who use non-traditional materials for their production.

Each object must represent its own time and therein lies its value and meaning. Time is as key an element in the design as manufacture; it moulds the shape of objects, it conditions their function and social utility, it defines the style, the choice of material and technique, it indicates its origins, stratifies its taste and, above all, it reveals its context. Objects are inextricably linked to time. In the case of jewellery, that correspondence is intermittent and discontinuous and, in history, this has not always been able to be the full and mature expression of the *Zeitgeist* and its climate.

The right question is, then, what is the mirror of our time? What does represent contemporaneity most of all?

The need of awareness. Consumers today, but also producers and people involved in the supply chain, need awareness and aspire to be responsible. What they want is intelligent and responsible beauty, a beauty that exploits tradition but also innovation in favour of thinking processes, materials and strategies. Because the opposite of beauty is not ugliness but ignorance.

And the luxury market has already understood this. It is extremely recent the signing of the Fashion Pact,² proposed by François-Henri Pinault, number one of Kering: the largest alliance in fashion, accessories and luxury that concerns the environment and has 32 global companies in the sector. So great that in the full version of the pact, under the heading who says 'we aim for representation of at least 20% of the global fashion industry as measured by volume of products. The goal would be to have a mix of luxury, "mid-level" and "affordable" brands across the fashion sector'. Together they account for about a quarter of the sector.

Another recent signal comes from The Union of Concerned Researchers in Fashion that believes that concerned fashion and clothing researchers can no longer remain uninvolved or complacent and that researchers need to conduct themselves in new ways. Among their purpose, there is the intention to create an 'activist knowledge ecology', that is, to develop a system of knowledge about fashion sustainability; to advocate for whole systems and paradigm change, beyond current norms and

²The G7 meeting was at Biarritz from August 24–26. French President Emmanuel Macron, accompanied by Economy and Finance Minister Bruno Le Maire, Minister of Labour Muriel Pénicaud and Deputy Minister of Ecological and Solidary Transition Brune Poirson, has invited to the Elysée Palace representatives of the 32 fashion and textile companies who have launched the Fashion Pact by his side.

In April 2019, ahead of the G7 meeting, Emmanuel Macron had given François-Henri Pinault, Chairman and Chief Executive Officer of Kering, a mission to bring together the leading players in fashion and textile, with the aim of setting practical objectives for reducing the environmental impact of their industry.

business-as-usual; to express our determined opposition to ill-advised and destructive fashion projects; to take a leadership role in debating existing and new ideas and creating action around fashion-sustainability themes, especially in areas where the generation of new knowledge is of actual or potential significance.

With the aim of spreading sustainability to the production, manufacturing, distribution, consumption and disposal of garments, accessories and footwear, including also social issues, the United Nations Alliance for Sustainable Fashion is operating in that direction. The United Nations Alliance for Sustainable Fashion is an initiative of United Nations agencies and allied organizations designed to contribute to the Sustainable Development Goals through coordinated action in the fashion sector. Specifically, the Alliance works to support coordination between UN bodies working in fashion and promoting projects and policies that ensure that the fashion value chain contributes to the achievement of the Sustainable Development Goals' targets. Fashion, as understood by the Alliance, includes clothing, leather and footwear, made from textiles and related goods.

It is interesting mentioning these examples to understand how different actors—companies, researches, associations and politicians—are facing the issue of being sustainable.

JEM Jewellery Ethically Minded intends to champion an introspective and invested jewellery industry that challenges the status quo and promotes the idea of ethical progress.

JEM is the first French jeweller to be engaged in the «Fairmined» industry. This label guarantees the ethical exploitation of gold, extracted from mines that have subscribed to a process of transformation towards eco-responsible progress. It is by ensuring sustainable development all along the value chain that JEM pursues its mission, in consciousness and transparency. At the same time, JEM commits to a true respect for human beings preserving skilled craftsmanship, particularly French jewellery making.

CRED Jewellery is a jewellery brand involved in sustainability since 1996 and founded to improve the lives of small-scale gold miners. It is immediately clear browsing in its website that opens with a bold message 'CHOOSE CONSCIOUSLY'.

They are a team of people focused on a mission to make beautiful jewellery by improving the lives of the communities who mine gold. Jewellery is made using the Fair Trade Gold Standard. From the very beginning, CRED supported sustainability's cause: working in partnership with miners in Columbia to establish the Alliance for Responsible Mining (ARM) to represent small-scale artisanal miners globally and promote socially and environmentally responsible practices; working with mining cooperatives in South America and the Fair Trade Foundation, CRED made the first independently guaranteed fully traceable jewellery in the world to bear the new Fair Trade Gold Mark; using lab-grown diamonds in the UK's first ethical lab-grown ring collection.

About the social impact of jewellery brand, it can be mentioned Eden Diodati, a prêt-à-porter jewellery that works with an extraordinary cooperative of women who survived the genocide in Rwanda. Employing centuries old artisanal heritage and craftsmanship, their skill, courage, fortitude and faith inspires Eden Diodati's

creative direction, while challenging preconceptions of ‘Made in Africa’. The aim of the brand is shifting paradigms in luxury fashion with a collection of high-end jewellery celebrating the craftsmanship excellence of our partner cooperative.

This makes us understand that the interests of fashion, jewellery and luxury goods, in general, are to succeed in being sustainable—overcoming the so-called paradox of sustainable luxury based on the fact that the production of goods considered ‘superfluous’ is unethical.

Yet luxury products, including jewellery, are sustainable for three main reasons: they represent a crucial sector for the global economy, as we have just seen from the data of the Fashion Pact; luxury helps to put into practice one of the principles of the ethical consumer, i.e. to buy goods by focusing not on quantity but on quality, thus buying in a more responsible manner. “Buy less, choose well and make it last” is a quota by iconic British designer Vivienne Westwood; true luxury is sustainable and respects people and the environment, taking also in consideration that a brand’s reputation increasingly passes through sustainability.

In addition to the striking case of the Fashion Pact, there are other signs that make us understand how the individual jewellery houses have already acquired sustainable logic by proposing models that favour a timeless design, a concept already very close to the dynamics of jewellery.

The concepts of ‘timeless design’ and ‘durability’ are, for example, at the heart of Patek Philippe’s motto: ‘You never actually own a Patek Philippe. You merely look after it for the next generation’.

Many more examples are explored in the following chapters. In detail, the first significant grafts for a sustainable supply chain are taken into consideration, respecting tradition and the *genius loci*,³ the environment and people. Subsequently, the opportunities and risks of progress and technological and digital innovation for the competitiveness of companies in both production processes and communication tools are also explored.

Going back to the dual etymology of luxury, it seems, hopefully, that the one related to the concept of light is more consistent with the contemporary and that the meaning of luxury is more and more close to beauty, ethics and intelligence than to vulgarity and degeneration professed by the ostentation.

Fortunately, because, as Dostoevskij said in *Demons* ‘Man can live without science, he can live without bread, but without beauty he could no longer live, because there would no longer be anything to do to the world. The whole secret is here, the whole of history is here’.

³Latin term meaning ‘the genius of the place’, referring to the presiding deity or spirit. Every place has its own unique qualities, not only in terms of its physical makeup, but of how it is perceived, so it ought to be (but far too often is not) the responsibilities of the architect or landscape designer to be sensitive to those unique qualities, to enhance them rather than to destroy them.

2 A Renewed Sustainable Tradition

Luxury should tell about excellence, the highest outcome of the production process, and luxury products stained by the burden of the environmental or social burden cannot be considered as exclusive or desirable. Environmental and social awareness cannot but be part of the production and distribution strategies of companies in the sector.

There are several options for promoting sustainable models: from the smart use of resources to the reduction of the impact on the environment, from the fair remuneration of workers and the safety of working environments to circular production systems where waste is minimized avoiding to end products in landfills, from safeguarding traditional heritage to fostering the research on new biocompatible materials. In this perspective of process optimization, even in the context of traditional craftsmanship, innovation is essential to reduce the waste of materials and resources.

The goldsmith world has become aware of the need for a reflection on sustainability, a central theme of contemporary thought and future development. In fact, according to some recent research that analyses purchasing behaviour—including ‘La sostenibilità cattura Millennials e GenZ’ (‘Sustainability captures Millennials and GenZ’) by Pwc Italia and the Ipsos survey for the 2018 edition of the CSR Show and social innovation—the topic of sustainability is central for young consumers. According to the data, consumers are willing to pay an average of 10% more for guaranteed sustainable and quality products.

The following are some case studies of best practices in the field of jewellery. The analysis takes into consideration both independent designers and established brands that are consciously pursuing the path of sustainability as a positive challenge, able not only to respond to consolidated consumer needs, but also to offer new opportunities for responsible innovation through respect for tradition, human and environmental resources.

2.1 *Respecting Diversity and Traditions*

In an increasingly standardized global system, cultural diversity is a universal value that must be defended, favoured and preserved (Universal Declaration on Cultural Diversity, Paris, 2 November 2001).

Some realities start from the recovery of the local manual making, of the artisanal practice. Ancient traditions, destined to disappear in the negative effects of globalization, are reviewed in a modern key, allowing not only the revival of techniques and aesthetic models, but also the disclosure of knowledge, conservation and dissemination.

This is the case of Madreforme by Carla Riccoboni. The jewellery collection belongs in all respects to the territory of origin, both in the genesis of the events and in the ability to transfer the values of tradition into contemporary aesthetics.

In 2006, the Angelo Tovo—a Vicenza company whose production was oriented to the creation of moulds for the goldsmith factories of the territory—closed up. Approximately 2500 mother-shapes, the prototypes necessary for the construction of the moulds were recovered and saved by destruction. The jewellery collection, recourse to the use of these moulds, is thus a memory for future generations and a stimulus for new applications of traditional forms in a contemporary way.

Other designers start with the processing of typical traditional materials. Marina and Susanna Sent belong to a family working for generations in the glass sector in Murano, the small island where Venetian glass crafting is based. In 1993, thanks to their know-how and knowledge of production processes, acquired thanks to the experience in the paternal company specialized in glass decoration, they give life to their business. The two sisters, complementary in training, one architect and the other with production-oriented technical studies, propose glass crafted in multiple expressions. They reinterpret the tradition, design the glass and translate it into light modules, transparent bubbles, halfway between pieces of jewellery and garments.

2.2 Respecting People

In this overview of jewellery sustainability, an important chapter is represented by craftsmanship and social inclusion, topics that are often dealt with together. The artisanal practice, in fact, in itself reflects the fundamental criteria of sustainability, giving value to the time of conception and making of a product, to technical experimentation, to the search for quality and perfection and to the passion for what one does. Some productive realities collaborate with local communities, training and offering opportunities for paid work to vulnerable people who have gone through difficult situations on a personal or social level, allowing their redemption. The ultimate goal is to generate business and trigger a virtuous mechanism of independence.

About this, SeeMe is a fair trade verified brand that designs and crafts ethical jewellery. After twenty years of dealing and reporting on women's conditions in the Middle East and North Africa, Caterina Occhio decided to take matters in her own hand creating SeeMe, a training centre and workplace for women otherwise deemed lost. All the jewellery pieces are handcrafted by women survivors of violence. In fact, SeeMe employs women, often single mothers, who have suffered violence and were ostracized from their communities. SeeMe employees learn the craft of jewellery making according to ancient Tunisian techniques. Therefore, while fostering their country's culture and traditions, they secure a workplace for themselves and a future for their families. By wearing the heart-shaped jewellery pieces, people decide to join the Heart Movement, a worldwide movement that wants to replace violence with love. On top of being a safe resort and source of income for women survivors in Tunisia, SeeMe also positively influences established brands in the fashion world, supporting an ethical approach to their sourcing procedures.

Or, again, Indego Africa is a non-profit social enterprise supporting women in Rwanda through education and economic empowerment. Founded in 2007, Indego

Africa partners with female artisans and sells their handcrafted products worldwide. Despite the modern formal appearance, workmanship and materials used for making the jewellery items are those characteristics of the communities in which the artefacts were made. All the proceeds from the sales, together with the donations, are invested by the organization in education programmes for the artisans who make the products.

The work of Riccardo Dalisi, then, combines the theme of training and social inclusion with recycling craftsmanship, providing for the recovery of waste materials to transform them into something new, according to the dynamics of circular economy. Recycling craftsmanship in fact starts from the transformation of materials that would have otherwise reached the end of their life cycle: thanks to design thinking and creativity, the waste materials are transformed into quality products. Riccardo Dalisi was among the first to use poor materials, such as tin, paper, copper, iron, sheet metal, ceramics, glass, wood, fabric, patiently turning them into pieces of jewellery. Self-produced pieces made by hand in his workshop, often with the help of unemployed youngsters to whom he taught a profession, demonstrating that, in a city like Naples afflicted by the waste emergency, jewellery could also have a social value. Dalisi introduced the topic of scrap in jewellery, proving that preciousness is not only that of materials and that tin and paper can have the same dignity as gold and diamonds. For Dalisi, in fact, the difference derives from the need for an ethical vision of jewellery that shuns the preciousness of materials to the benefit of creativity.

2.3 Respecting the Environment

Not only maximizing the social impact, but also minimizing the negative effects on the environment. Pollution in the jewellery sector is often linked to the choice and supply of raw materials.

The extraction of gold, one of the most used materials in jewellery, has over time not only caused the eviction of indigenous communities from the regions concerned, but also polluted the aquifers with chemicals—such as cyanide and mercury—which are used for the extraction of the precious metal from the mineral. Industry is now directing its efforts towards certifying gold meeting international sustainability standards.

Among the forerunners, Chopard, which already in 2013 initiated a programme dedicated to ethical and sustainable jewellery launching the first Green Carpet Collection with Fairmined Gold—that is extracted in certified mines—and diamonds from a producer certified by the Responsible Jewellery Council. The Maison since 2018 uses ethical gold in 100% of the production. Chopard purchases the precious metal exclusively from traceable routes.

The precious stones sector has also taken an active role in promoting sustainability, as shown, for example, by the activities of the Kimberley Process, the certification agreement developed and approved with the joint effort of the governments of many countries, of multinationals diamond producers, and civil society.

Reducing the environmental impact is also possible by creating durable objects and promoting creativity through circular strategies. Producing enough gold for a simple wedding ring creates at least 20 tons of waste. Thus, since 2006, Monique Péan uses only recycled gold and platinum. The designer's recycling activities are not limited to metal, but also include the recovery of precious stones: she travels around the world to find materials that do not require industrial extraction. She collaborates with local artisans and turns to researchers to assess the sustainability of the materials she finds.

Recycled gold, silver and other metals are very on-trend right now as they claim to reduce primary mining and make a real difference to the environment. They are recycled from the Earth's existing metal supply like discarded technology, such as mobile phones, televisions and computers and make an eco-friendly alternative to the socially and environmentally destructive process of mining the earth.

In this age of technology, with rapid advances and built-in obsolescence, enormous amounts of electronic waste are produced. Furthermore, as gold is a valuable substance worth recycling, it also enables the co-recovery of many other less-valuable metals and ceramics. Some may claim recycled gold is nothing new as the jewellery profession has recycled its metal since artisans first started crafting gold and silver adornment some 5000 years ago and the process for scrapping gold and silver is standard practice within the industry, but still, it is very newsworthy.

The Campana Brothers, the creative duo of Brazilian designer brothers, are part of this scenario of valorizing local materials, often discarded, with the aim of protecting and safeguarding the environmental resources.

The materials, be them humble and modest, or rich and sumptuous, for the Campanas are always the starting point for the design process, from chairs to lamps, from fashion accessories to jewellery. Bones' Structure, for example, is a modular necklace formed by a set of scrap leather parts that can be assembled in various ways by the consumer through magnets. Production waste usually has irregularities that make the pieces unique and never obvious in their imperfection.

The concept of modular product is itself part of global sustainability perspectives because it offers the possibility of combining the elements in countless configurations, satisfying the need given by different occasions of use. In fact, modular jewels allow the user to intervene on the arrangement of predefined parts, to combine them and wear them in various ways. This is the case of Precious Molecules by Massimiliano Adami, a collection made up of submultiples, assembled parts, each of which forms the core of the structural elements of the jewellery piece. Units to be assembled as parts of a kit, as in the Drilling Lab Project which creates a precious alphabet reinterpreting the structures of industrial clamps; Manuganda's Compo describes a modular chain that can be disassembled and reassembled in different ways, stimulating the creativity of the wearer.

With a view to global sustainability, research is moving towards the development of ecological and performing materials and the optimization of production processes in order to reduce resource consumption and the use of toxic substances. The key to renewal lies in interdisciplinary experimentation, the outcome of a mixture of

sectors, skills and processes, in which science, ethics and aesthetics are integrated to create something new.

Today experiments on alternative non-polluting materials are increasingly frequent. Taking into consideration diamonds, one of several issues that the industry is buzzing about is lab-grown ones. Consumers are asking for them even if there are not on the market yet. The appeal of lab-grown diamonds goes beyond their being priced 20–30% cheaper at retail than mined diamonds. Consumers are drawn to them because they do not contribute to the destruction of the environment and no one is harmed in their creation, two big considerations that tie into the ‘responsible sourcing’ movement that is gaining traction among consumers, particularly Millennials. Therefore, manufacturers should surely begin thinking about incorporating them into their lines.

These options have a number of benefits as they require less human labour, have a reduced carbon footprint, are indistinguishable from their natural counterparts and come with a significantly lower tag price. But at the same time, designers warn against using artificial stones exclusively, since could deprive entire mining communities of their livelihood.

The case studies shown above are just some emblematic examples of a global vision that aims to combine aesthetics and technique with an ethic that is attentive to the choice of materials, to the respect for the environment, to the recovery of the collective heritage, to the know-how linked to the territory.

The new work system provides for the sharing and optimization of resources in a relationship open to change. About Fucina Orafa, for example, is an Italian reality, a place where it is possible to create and learn, with a view to sharing knowledge, saving resources and spaces. It is an independent laboratory for goldsmiths, students and artists linked to the world of art and jewellery, a network of professionals who collaborate with each other, keeping alive the goldsmith traditions combined with contemporary techniques in order to achieve high-quality jewellery pieces.

3 The Digital Shift: The Impact of Digital Technologies on Jewellery

The shift from a craftsmanship-based methodology to new models of productive processes was marked by the first industrial revolution: the handcraft know-how had been gradually flanked and, for some sectors, entirely replaced by the use of machine tools, with significant benefits in terms of quantity, speed and efficiency. It is during the industrial revolution, the transition from the artisanal manufacture to the mass production, that for the first time the contrast between *manus* (hand) and *machina* (machine) comes to light, two opposing elements which have characterized every productive and artistic sphere for the centuries ahead [1].

Also, the jewellery sector, thus, has been affected by the dichotomy generated from the manufacturing revolution.

Hand manufacturing and mechanized production, respectively, hand and machine, have marked and settled over time two opposite ways of creating and therefore conceiving jewellery: from the one side the manufactured object, aimed at an elite and associated with luxury; on the other side the piece of jewellery industrially produced, addressed to the mass market.

The current revolution has marked the transition has globally fluidified the system: in the age of digital technology, the distinction among the different spheres is increasingly less defined, the productive paradigms tend to blend and to contaminate each other, reducing progressively the antithetical distance between hand and machine. Even though the dichotomy is still representing a significant characterizing element for the jewellery field, the boundaries between the two different production processes are becoming more and more blurred and the cases of a hybrid approach are more frequent.

The artisanal practice of making jewellery is in fact more often integrated with the use of digital technologies, such as the one of additive manufacturing, and the creative processes are shared online. The precision and careful attention to details that has characterized traditional jewellery making can be flanked by a new dimension, that is the one of the web, considered not only as a network of processes and data but as an integrated and interactive system that holds together people and things. In this context, small- and micro-companies, using new flexible production technologies, are able to produce small batches or even unique pieces, customized with different finishes, so as to be able to combine artisanal quality with industrial processes.

To this end, some interesting case studies are Bijouets and Maison 203, two of the main Italian companies that have introduced 3D printing technologies into jewellery without neglecting craftsmanship quality and formal beauty. All the 3D printed pieces are rigorously finished by hand and conceived by professionals coming from other sectors, such as architecture and product design, who contribute in terms of cross-fertilization as well as contemporary aesthetics. The result is a rich and varied production that intersects design, technological experimentation and craftsmanship [3].

Bijouets, founded in Trento by Ignazio Pomini and Fabio Ciciani in 2010, is dedicated to making accessories with professional 3D printing techniques. Pomini immediately understands the potential of this jewellery technology and, with the creative direction of Selvaggia Armani and with the contribution of different designers such as Federico Angi, Filippo Mambretti or Maria Jennifer Carew, Bijouets becomes a reference for 3D jewellery at an international level.

Another Italian company of reference is Maison 203, which represents one of the most interesting examples of digital craftsmanship of accessories in nylon and PLA (a bioplastic derived from corn starch), to which are added special editions in steel and polished brass. The company was founded in Treviso in 2011 by designers Orlando Fernandez Flores and Lucia De Conti and design is one of the fundamental ingredients of their production, which relies on the collaboration of the best Italian designers such as Odoardo Fioravanti, Giorgio Biscaro and Giulio Iacchetti.

If the jewellery of Bijouets and of Maison 203 are declined according to the languages of fashion, other designers choose 3D printing to make artistic jewellery pieces, as happens with Ross Lovegrove who created 3D printed gold items for the

London gallery of Louisa Guinness, demonstrating that this technology also fits the needs of art.

The introduction and diffusion of digital communication and production technologies—has entailed a radical change which has affected the very notion of artefact, luxury and sustainability. Aesthetics and technical skills have now been joined by the ethical selection of materials, respect for the environment and the protection and promotion of the joint cultural and traditional heritage associated with the surrounding territory. Biology, chemistry and engineering have greatly contributed to the identification of solutions favouring sustainability, thanks to the development of new materials that are either recycled or made of biocompatible and biodegradable natural fibres, as seen with the pieces made in 3D printed PLA by Maison 203; digital technologies, however, can also supply some solutions which may make the production more sustainable.

Indeed, digital technologies have favoured the transition from centralized and large-scale systems of design and production to decentralized or distributed systems in smaller units and connected to the network. The production distributed on demand reduces the resources used, the costs of production, packaging, transportation and even the waste of finished products that remain unsold. The artefacts are therefore territorialized, and they are produced closer to the final consumer, thus reducing the pollution linked to the use of superfluous resources and to transportation.

Modern design arose from industrial chain production with great output and brought about the aesthetic standardisation of the industrial offer, whose only lingering value resides in its very brand name; design's widespread presence and distributed production, however, Srari et al. [15] do not supply only products, but also services which are instrumental in the creation of customized objects, and which actively engage consumers by educating them and stimulating their creativity. The serial production of the finished product is replaced by the design of models, digital platforms and semi-finished products which may be modified, customized and finished by the consumers themselves.

The attribution of an active role to the consumer, his involvement in the practical definition of the artefact, makes him more sensitive to the problem of waste. Technology has led to a massive penetration of design into the everyday life of consumers, who have progressively taken on a much more active and critical, more attentive and responsible role and claim the right to be able to take part in the creative phase.

The dynamics surrounding the cooperation and web-based design stage is somehow steeped in an 'achronic dimension' [13], in which the various stages may overlap: the implementation and creation stages take place simultaneously, and it is indeed possible to consider also the design, production and distribution stages as synchronous. The design aspect expands and moves from a closed to an open condition and consequently evolves from being a personal expression of individual talent to a collective profession [3]. The 'open' qualification applied to digital design needs to be contrasted with industrial design, whose output is by definition closed: in serial production, the object is defined conclusively, and the creator and the interpreter coincide in the same person [7].

These phenomena seal the final abandonment of the serial production paradigm. Industrial production traditionally envisaged the exact reproduction of a model as a series of identical objects; over the past few years, technological development and social change have determined the elimination of the contraposition between unique pieces and reproduced ones, between the model and its reproductions, and production approaches have become blurred. This has been made possible by the creation of automatically finished pieces from a drawing; such a change emerged gradually in the last decades of the twentieth century and has entailed renouncing the idea that a project is definitively finished in itself.

The coupling of the web with the new technologies permits the elaboration of a collective project in which the final product is determined by the buyer: a sort of hybrid object suspended between industrial production and individual creation. It has therefore been a veritable revolution which has changed concepts such as serial production, multiples, processes, as well as the role of designers, producers and consumers; the final result cannot be anticipated.

It is not just consumers who can now select and create their own objects industrially: digital technologies have also been able to provide diversified solutions throughout the production chain in answer to the demand for tailor-made products, services and experiences which may be endlessly customized.

The real revolution which the development of new technologies has entailed thus consists in the possibility to autonomously create objects which totally match individual needs, desires and size. The contemporary world is witnessing a changeover from standardized production to one that is more flexible and oriented towards consumers' customization: objects are designed ad hoc and are produced in a system that conjugates the potential of mass production plants with the flexibility afforded by the new hardware and software.

The widespread presence of digital technologies has optimized and concretely improved jewellery companies' performance, but has also provided the possibility to affect the final users' experience. Indeed, the new powerful technological tools available constitute an open system and manage to involve consumers at all stages.

This systemic interaction generates an added value in terms of experience and amplifies the emotional component associated with the product.

Indeed, the new technologies enable designers to dynamically engage final users online already during the designing and production stages, in order to achieve a product which may fulfil the customers' needs as much as possible both in terms of wearability and aesthetics.

An example of this is the Orchid by Studio Minale Maeda for Chi Ha Paura...? The project consists of a 3D printed orchid boutonniere that can attach to a buttonhole as well as be clipped on any garment by its own stem. The shape of the flower is generated each time anew when it is bought, based on a variety of influences like location, climate, soil, season and many more. If one does not like the result, one can wait for different conditions to get a different orchid before purchasing it.

Digital co-creation platforms enable the establishment of a new virtual space for cooperation, in which designers no longer define the object's final structure, but in fact regulate and programme the procedure itself: designing therefore consists in defining

algorithms on the basis of parametric dynamics which can generate structures with endless variants while retaining a consistent overall matrix. A pioneering example of virtual interaction in the jewellery sector is supplied by the nervous system, which thanks to generative systems, 3D printing and digital platforms releases online apps that make design more accessible by allowing users to create their own products. These tools empower users to interact directly and intuitively with the graphic interface; users can thus create endless formal variations and generate structures inspired by nature or by the fractals' perfect geometry, complex and ever-changing figures which constitute unique pieces and which may be booked for ad hoc production.

Virtual platforms have also emerged which make the production chain shorter and more interactive, still with the final goal of letting customers play a greater role in the process. I materialize, Shapeways, Sculpteo and Thingiverse are only some examples among the many which let users upload their own digital design, select their material of choice, prototype it and possibly even sell it online.

The new technologies go beyond customization and unique pieces and even go as far as tailor-made production. Three-dimensional scanners can measure and trace precisely and rapidly the three-dimensional shape of the human body on which the product will be modelled.

Three-dimensional scanning, the new frontier of sizing, constitutes a veritable virtual leap forward. It is possible to create tailor-made items simply by scanning the body; the scan will form the basis for a three-dimensional model, which once worn by an avatar will provide an early idea of the physical prototype. Thanks to virtual prototyping these models may be consulted, tested, modified and rectified just as if they were physical objects, without having to resort to any production resources or materials.

The possibilities offered by 3D scanning technologies are not confined to process optimization or to the goal of providing end users with a product that perfectly fits their body beyond the notion of 'size', but actually extent to suggesting interesting starting points for artistic and designing experimentations. Suffice it to consider Portrait me, Vivian Meller and Laura Alvarado's project that reinterpreted in a modern and ironic perspective the traditional cameo: the subjects were dressed in re-enactment clothing, faithfully reproduced by the 3D scanner, and the acquired data was then printed in a collection of brooches by means of selective laser sintering.

4 The Power of Communication: From Exclusivity to Inclusion

The Latin *caveat emptor* means 'let the buyer beware!'. It is composed of the verb *caveo*, used in exhortative and impersonal form, and the noun *emptor*, buyer.

Born at a time when there was no legislative protection for economic actors, this way of saying has remained relevant over the centuries. Although jurisprudential law, through the discipline of unfair competition, has issued rules prohibiting dishonest

behaviours aimed at deceiving the public, contrary to the principles of good faith, loyalty and honesty, it is a good practice still today to pay attention when buying any good or service. Specifically, greater attention should be paid during the most particular and least frequent occasions of purchase, that is, when one buys a good that is very expensive or that is not part of daily consumer behaviour.

This expression is still very relevant in its ability to highlight the importance of information for the consumer.

Today, consumers must be aware of what they are buying and, at a time when obtaining the information they are looking for has become very fast and easy, it is not justifiable to behave in a disinterested manner. However, this excess of information—from the print media to social media, radio, television and blogs—requires greater consumers' participation in selecting contents.

In the early years—more or less throughout the first half of the twentieth century—of mass communication the media and messages available were limited number. There were very few sources of communication and a symbolic universe not as crowded with messages as today. Over the years, especially thanks to technological innovation, the number of broadcasters and the number of messages has increased dramatically, so that today we can precisely speak of a situation of abundance.

This not only generates, as already mentioned, an orientation effort in the person who receives the message but also in the person who sends it. The downside is, in fact, that in a mare magnum of information, brands or producers must ensure that they find a way to be heard, to create a priority between the information they transmit and communicate effectively to the public.

Communicating means, in fact, first of all, to transmit a message to one or more people. A subject, action or message begins to live as soon as it is communicated. Secondly, communication is the elaboration and sharing of meanings, which means organizing a structured and understandable communication that does not frustrate all the efforts of companies that operate in the name of sustainability. Ultimately, it means building and modifying relationships, creating a community, but also making sure that there is a responsible consumer who listens and is able to make a critical and ethical assessment.

Communication is structured like a chain, and it only takes one link to weaken to make it less effective or completely powerless.

The first link, the key element of the message, is the issuer who, through a channel of transmission, sends the body of the conversation, the message, which in turn contains a referent, or topic and is structured according to a code. Finally, through a reception channel, the receiver receives the message sent by the issuer.

In this chain, each character has its own responsibility. The theme of sustainability, therefore the message, is extremely complex but at the same time it is a priority. Therefore, in order to ensure that the message arrives unhindered from the issuer to the receiver and is absorbed correctly, four factors are needed that, in communication theories, guarantee the effectiveness of the result: listening; mutual interest; understanding and acceptance; and changing an attitude.

4.1 *Listening*

Listening means creating the conditions for the issuer to send out a message and make sure someone gets it. A statement by Manuel Castells, now famous, compares today's speed with the previous rhythm of change: 'in the United States the radio has taken thirty years to reach sixty million people, television has reached this level of diffusion in fifteen years, the internet has done so in just three years since the birth of the world wide web' (Castells 1996).

Today, reaching a very wide audience has become extremely simple and democratic. Luxury, which has always been undemocratic by definition, has also succumbed to the new policies generated by digital communications. Particular reference is made to social media, one of the most popular media today.

Many of the jewellery brands have in fact approached digital marketing strategies. As an example, David Yurman for several years has been collaborating with the most popular Instagram influencers—Wendy's Look book, Brooklyn Blonde and Atlantic-Pacific, uses Instagram's social shopping function to increase sales directly from within the app and invests in collaborations such as the one in 2017 with Elle for the first Facebook live stream of the magazine. The partnership not only allowed them to reach Elle's audience of 4.7 million Facebook followers in addition to their own, but also drew on the power of two influencer guests of Instagram, Erica Hoida and Lucy Hernandez, who at the time had a total of over 880,000 followers.

Bulgari, one of the most famous high-end jewellery brand, has also been successfully implementing digital jewellery campaigns with the support of influencers for some time now. This year the brand worked with four major Arab influencers—actress Tara Emad, model Rym Saidi and style influencers Lama Al Akeel and Fatma Husam—in a dazzling campaign directed at the Arab market. Bulgari shows particular attention in conversations generated by hashtags that encourage followers to create personal content.

Buccellati, the famous Milanese fine jewellery brand, is also involved in digital strategies. One of the most interesting recent campaigns has been the collaboration with Noonouri, a virtual influencer with over 86,000 Instagram followers.

It is clear that the role of mediators, in this case of influencers, is a fundamental tool to facilitate and amplify communication channels. The use of influential characters does not only occur, however, on social networks, but also in the actual collaboration on the product.

In particular, in the field of sustainability, the collaboration between Penélope Cruz, a Hollywood star and very committed humanitarian activist, and Swarovski is exemplary. They are working together to pave the way for the creation of sustainable jewellery, without giving up on luxury design. In June 2019, they launched the latest collection of conscious luxury jewellery, using only responsibly sourced materials.

One of the goals of the collaboration is to encourage jewellery buyers to be more aware of the benefits of environmentally friendly practices and inspire the individual to make a difference. This is the first time Swarovski has worked with a major celebrity to create an ethical jewellery collection, and they follow in the footsteps

of Chopard, which has co-created designs with the likes of Marion Cotillard and Cate Blanchett.

At the same time, more and more platforms are being created, both real and digital, dedicated specifically to the theme of sustainability and its intertwining with the worlds of luxury. An example can be *Eluxe Magazine*, the world's first-ever publication fully dedicated to sustainable luxury. It is a quarterly published paper magazine and a daily updated digital publication based in London, dedicated to showcasing luxury brands that demonstrate a strong commitment to good ethics and environmental sustainability.

If the examples cited so far, however, see as the final user mainly the consumer, there are, on the other hand, also 'listening areas' for professionals. In these areas, all the activities involving the actors of the supply chain are presented. One example is the *Responsible Sourcing Blue Book* produced by CIBJO, which provides a framework and guidance for ethically sourcing gems and precious metals responsibly in the jewellery sector. Or the *Responsible Jewellery Council* helps companies of all sizes, throughout the jewellery supply chain, meet the rising ethical demands of peers, consumers, financial institutions and civil society.

It does so by providing a clear set of standards—the RJC 'Code of Practices'—which is verified through a third party, independent, certification process. Adoption and adherence with the RJC's Code of Practices presents a pathway for companies to address sustainability best practices and align with the 17 United Nations Sustainable Development Goals.

4.2 Mutual Interest

The second phase, after listening, is the creation of a conversation. The actors involved in the communication are both active parts. Because of the leading role, social media have nowadays luxury fashion consumers which require an interactive approach from brands. This is high contrast with the past single-sided selling strategy, needs and demands of consumers are becoming a pillar on which to build the approach to the market. On the basis of that, social media is thought to be a great way for luxury brands to gain information about market needs from customers themselves [12]. Social media created the necessity for luxury fashion brands to move from very traditional advertising strategies to SMM (social media marketing). This latter approach is more of slow-building, delivering solutions, generating curiosity and seeking feedbacks (Rubinstein and Griffiths 2001) for a continuous improvement of goods, services and customer relationships. Indeed, social media can act as a great deliverer of the luxury dream, a pillar of the whole industry. This because through platforms like Instagram, Facebook, Snapchat and so on companies can communicate a lot with potential customers and fans, utilizing all the tools and features of those websites.

The conversation about the theme of sustainability in jewellery is now very heated. Just open Instagram and look for the hashtag #sustainable jewellery to see that it

appears in 75.8 K post, the hashtag #ethical jewellery in 120 K post, #recycled gold in 44.9 k post. Generally, hashtags were born with a specific purpose: to involve web users on a particular topic and group all these conversations under a single hat in order to generate new conversations or participate in the existing ones. The power of hashtags is that they instantly expand the scope of messages, intercepting, in addition to followers, also all those users who are not followers but who are interested in that particular topic.

For this reason, hashtags are an excellent gauge to understand how much the public is involved in some issues and what are the trends.

Looking for the #sustainable jewellery hashtag, for example, immediately suggests new related themes such as recycled jewellery, ethical jewellery, recycled gold, eco-friendly jewellery or artisan jewellery.

However, in addition to the digital worlds, a series of places and events have also been done with the aim of creating a network around the theme of sustainability in jewellery but also in an attempt to disseminate the processes already underway.

An example is the Andrea Palladio International Jewellery Award, an international award dedicated to the excellence of contemporary jewellery in the fields of design, production, retail and communication and promoted by Italian Exhibition Group. Among the various categories awarded, the 'JEWELLERY CORPORATE SOCIAL RESPONSIBILITY AWARD' stands out since 2014. It refers to the best goldsmith company that has based its production processes on responsible practices from an ethical, social and environmental point of view, with respect to human rights, from the extraction of precious materials to the marketing of the finished product.

Since the first edition in 2014, personalities of the calibre of Eli Izhakoff have been awarded for their activity in the world of jewellery from an ethical, social and environmental point of view, Caterina Occhio for the SeeMe project and brands such as Pandora, which has made social responsibility one of the constraints on which to base its decisions in terms of design and materials, or Chopard for its commitment to the project with Eco-Age.

This type of initiative helps to strengthen the dialogue between the various players in the supply chain, as well as involving new ones. Furthermore, the establishment of an award helps and generates and gives visibility to models that can act as a driving force for the realities of the same world.

More and more frequent are also the events and conferences organized around the specific theme of the sustainability of jewellery. One example is the Chicago Responsible Jewellery Fair, founded in 2017, when jewellery designer Susan Wheeler decided to bring people together across the world to discuss how to make jewellery supply chains more transparent and make jewellery business more beneficial to all members of the industry vertical. The CRJC's mission is to engage everyone in the jewellery industry: miners, makers, professionals, educators and students. To address all the ways that individuals and companies can be involved in the responsible jewellery movement. To make a difference by making things happen.

Or also the Jewellery Industry Summits—the first in 2016—invite a broad group of designers, manufacturers and retailers to share their perspectives, experiences and ideas for a better way. This inclusive approach creates an opportunity for participants

to take steps to improve responsibility and ethics in the creation of jewellery, no matter where they fall in the supply chain or what stage their business is at.

Vicenzaoro also dedicates lots of seminars to the topic of sustainability. At Vicenzaoro September 2019, the topic of the seminar organized by CIBJO, The World Jewellery Confederation, is sustainability and responsible sourcing in the Jewellery industry.

4.3 Understanding and Acceptance

Once the message has been generated, listened to and has aroused interest in the receiver from the next phase is that of the acquisition.

Specifically, awareness is generated in the buyer who becomes able to make a critical and ethical assessment. The consumer begins a ‘sustainable thinking’ having understood the importance of the traceability of the supply chain, the transparency of processes and materials, optimization of water, energy and chemical consumption.

4.4 Changing an Attitude

Lastly, the information is understood and acquired to such an extent that it had a real effect on the consumer and consequently on the purchase.

At the time of purchase, therefore, the consumer wonders about the life cycle of the product and must be able to receive all the information he or she needs to make a responsible choice. In this, many brands are acting in an exemplary way to make each product transparent and traceable. If the communication strategy in the past was aimed at transmitting information about the physical features of the jewellery piece, today it is storytelling-in-action focused, conferring more importance to the immaterial and experiential values and also to the ‘life’ of the product itself.

The product itself, through digital labels, QR codes, for example, can tell their story, and this clearly represents a competitive advantage for the company.

Being transparent means acting in the sign of sustainability and not being afraid to tell how to act, but, on the contrary, trying to communicate it as much as possible. Companies striving towards sustainability are not afraid to report the targets they have set and transparently show how far they have come and how much further they need to go. At a minimum, material issues to report include supply chain, traceability, fair trade, waste management and environmental pollution. Large companies such as Pandora and Tiffany & Co have started such reporting.

Tiffany & Co. has a reputable mine-to-market programme that provides consumers with the transparency and traceability through its Social Accountability Programme, which traces the company’s products as they evolve throughout the supply chain.

Also, the Diamond Source Initiative is the most recent launched by Tiffany & Co., and led by Anisa Kamadoli Costa, chief sustainability officer of Tiffany and senior

vice president diamond and jewellery supply Andy Hart, in early 2019 to promote traceability and transparency in the diamond industry. Consumers will be able to know the origin (region or country of origin) of all diamonds recently mined above 0.18 carats. Each diamond is engraved with a serial number and customers receive a certificate of origin for the diamonds. By 2020, the New York giant will also be able to share information on the intermediate stages, including where diamonds are cut and cleaned.

For this initiative, Tiffany & Co. uses a proprietary and secures database that links the serial number of the diamond to its origin and craftsmanship. Yet the traceability of diamonds is mainly associated with the blockchain technology that is still evolving today. When the Kimberley Scheme for conflict-free diamonds was introduced in 2003, it was one of the earliest traceability programmes in ethical sourcing. But today blockchain technology is coming to the jewellery industry to guarantee absolute traceability of every element in the jewellery supply chain. Blockchain tracks raw materials—like gold or diamonds—from the mine to the refiner or gem cutter, through distributors and manufacturers, to the retailer and to the consumer. But the real innovation it is that instead of keeping a paper log, the raw material is assigned a serial number, and data is entered into the digital ledger, as it moves from place to place, throughout the material's transformation. Blockchain systems cannot be edited and they are extremely secure, so the data that is entered for each step of the process is permanent. The technology enables diamond suppliers to replace a paper certification process with a blockchain ledger.

Some companies are applying blockchain in their supply chain tools. Everledger Diamond is a traceability initiative built on a blockchain-based platform for the diamond and jewellery industry with the aim to engage all industry participants including manufacturers, retailers, and consumers to know a diamond's story from the origin to the end customer.

Trustchain is a blockchain created by IBM that proves the provenance of jewellery by following the supply chain from mine to store. It includes a consortium of companies involved in every step of the supply chain: Asahi Refining, the precious metals refiner; Helzberg Diamonds, a US jewellery retailer; LeachGarner, a precious metals supplier; and The Richline Group, a global jewellery manufacturer.

Tracer is an online distributed ledger based on blockchain created by DeBeers that improve global provenance in the diamond and jewellery supply chain. It is very significant information because 70% of the world diamond comes from DeBeers sites.

Bit Carat is a start-up with the aim to create an asset-backed token that allows the trade of certified and safe diamonds through traceability using the blockchain, ensuring the origin of natural diamonds throughout their history.

Currently, on the market one can find natural diamonds, fake diamonds and synthetic diamonds. Synthetic diamonds have the same physical and molecular characteristics as natural diamonds, but they are human-made and do not take 3 billion years to form like natural diamonds. The process for their production is costly due to high-energy consumption, but it has been now so refined to produce diamonds

which are difficult to distinguish from natural. However, synthetic diamonds have a value of 40% lower than the natural ones.

In order to be able to distinguish the two types of precious stone, the blockchain could be the ideal solution. This because the blockchain can create a unique token for each natural diamond, with the physical characteristics of the product that cannot be changed, and that can be recorded and traced across the different steps; from the mine, to the cut to the final buyer. Also, certified security tokens would allow easy transfers among buyers.

The evolution of blockchain technology reveals optimistic scenarios for consumer information. It is not difficult to imagine how, in a few years, the consumer could be able to use a smartphone to determine a gem's provenance.

5 Conclusions

The essay highlights the contemporary challenges at the intersections of three main areas: luxury, jewellery and sustainability.

It does this by analysing the opportunities and limits of the enhancement of goldsmith artisanal tradition but also taking into consideration the opportunities offered by digital innovation. It is important to underline that one does not provide for the exclusion of the other, but rather as analogue and digital, hand and technology find their greatest balance and their maximum enhancement in coexistence.

The very rise of a new kind of consumer, more critic, aware and responsible, with 'sustainable thinking', makes it possible to dare with more fluid assessments that do not include categorical judgments in favour of one or the other approach, understanding the life cycle of the product at 360 degrees. Precisely for this reason, it is necessary to communicate information, to do it clearly in order to involve and convince the consumer to invest in sustainability.

There is a famous phrase from the science fiction writer William Gibson that says 'The future is already here—it's just not very evenly distributed'.⁴ It is something to be built together, creating a dialogue and fostering harmony between designers, companies and consumers and, based on their and our ability, transforming everyday life.

Contributions

1. Luxury: From Preciousness to Awareness by Prof. Alba Cappellieri.
2. A Renewed Sustainable TRADITION by Dr. Susanna Testa.
3. The Digital Shift: The Impact of Digital Technologies on Jewellery by Dr. Susanna Testa.

⁴1990, *Cyberpunk* (Documentary), Directed by Marianne Trench, Produced by Peter von Brandenburg, An Intercon Production. [Excerpt occurs in Part 3 of 5 parts; Timecode 12:20 of 14:59] (Video available in 5 parts on youtube; Viewed on 2012 January 24) link.

4. The Power of Communication: From Exclusivity to Inclusion by Prof. Livia Tenuta.
2. Conclusions by Prof. Livia Tenuta.

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