

Territory, Sustainability and Design

From Traceability to the Upgrade of Production Waste

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Abstract

Design is the discipline capable of interpreting technical, economic, social and cultural transformations, coming into close contact with the concrete dimension of the territorial context and acting on the processes of competitive enhancement of single companies and of local business systems.

Starting from these premises and with the purpose of allowing the territory to absorb values such as sustainability, identity and brand recognition strategies, the envisioned change — beyond the project level — is cultural.

Two research projects dedicated to the integration of good practices for sustainability in the territorial context of Veneto demonstrate how a virtuous circle can be implemented starting from the concept of dedicated tracking systems for companies up to the design for a sustainable management of waste. This positive process consists of new relationships and active exchanges of skills, bringing to light those already existing. In this way, the profound meaning of belonging to a cultural identity is integrated into the planned development of companies.

Keywords

Sustainability
Territory
Upcycling
Material experience
Knowledge innovation

Sustainability as a Key to the Interpretation of Cultural Identity

The process analyzed in this paragraph starts from the construction of a platform for study, research and project activities. Two main factors are crucial to these activities:

- 1 a multidisciplinary comparison between design processes and technologies implemented by design;
- 2 the collaboration between universities and local companies. Can these two goals be considered the first condition to start a process of *anticipation*?

If by *anticipation* we mean “the natural need of man to formulate hypotheses about the future, to choose one of these situations, the most suitable for the circumstances and resources available, and to work to build the conditions for this circumstance to come true” (Celaschi, 2016, p. 19), then starting from the analysis of the social and cultural productive context of the Veneto we set the goal of understanding how sustainability — intended in its environmental, social and economic multi-dimension — can activate innovation processes in both technology and meaning.

The identification of a specific local knowledge, which is the generator of tangible and intangible resources, is therefore to be understood with a view to developing added value. In this way, local knowledge encourages the search for innovative interventions. These innovations are generated by the design discipline in its strategic potential, not only in the perspective of the development of a new product.

The design chain of the Università luav di Venezia has constantly investigated its function in relation to the reality of businesses and, more broadly, to the so-called “territorial capital” (Bassi, 2018). This capital should be intended as people with their skills and competences, socio-cultural and environmental resources and so on (Lotti & Trivellin, 2018).

In particular, since 2019 it has been possible to activate and develop a research path consistent with this kind of strategies, obtaining two regional fundings. In the first case, the funding was dedicated to supporting the Innovative Regional Network (RIR) Face Design²; in the second case the funding, currently underway, is granted by the European Social Fund (ESF) invested by the Veneto Region in research supporting growth and regional innovation, as well as strategies for the local university system.

The first project has investigated the meaning of traceability for sustainability, defining possible design directions. The second project — intended as the continuation of the first one — is currently working on the practical application of one of those directions: the reuse of production waste in the tanning industrial context.

1

Alberto Bassi is author of *Sustainability as a Key to the Interpretation of Cultural Identity*.

Lucilla Calogero is author of *Traceability for Sustainability: Economic Value and Design, Concept Design of Dedicated Traceability Systems Dedicated for Companies and Trajectory of Project: From Concept to Development*.

Michele De Chirico is author of *A Case Study: Design for the Sustainable Management of Leather Production Waste and Sense Making Material*.

2

<https://www.face-design.it/> (accessed May 22, 2021).

Traceability for Sustainability: Economic Value and Design

The research project *Traceability for sustainability: economic value and design* has been financed as a part of a wider program titled “Innovative Regional Networks — Veneto Region”. This program involved two universities in Venice, Iuav and Ca’ Foscari, as well as company partners belonging to the network Fashion Creative and Design Driven Industries within the footwear industrial district of the Riviera del Brenta.

This project involved two university research groups complementing each other in their interdisciplinary skills: a design research group and an economic research group. Both groups worked together to assess the current level of innovation of local companies in terms of traceability systems, good practices for economic and environmental sustainability, as well as the exchange of knowledge on a local scale.

Research activities have been organized as integrated workshops. The design research group analyzed technological systems for product traceability. Processes defining the creation, production, distribution, and communication of a product have been investigated as factors potentially developing sustainability. The economic research group dealt with traceability as a means to sustainability within global chains of value. The latter have been reframed as a means to enhance and develop the companies’ competitiveness, both on a national and international scale.

In the past traceability has been partially analyzed with a technocentric approach, but in Italy this topic remains largely overlooked. From a scientific perspective, traceability raises compatibility issues related to sustainability strategies in terms of process, methodology and communication. These aspects have prompted the idea of developing a research project involving experimentation. The topic of traceability is significantly connected to contemporary challenges because of two factors: the first factor relates to data communication, the second is connected with the sustainability of products and production processes.

As for data communication, in recent bibliography traceability has been intended as a means to the enhancement of the production chain, and to the safeguard and communication of products and services (OECD, 2017). Traceability is also connected to the “datification of society” (Mayer-Schönberger & Cukier, 2013). This definition reflects the transformations that nowadays originate a massive production of data, and as a consequence their processing and management.

These new circumstances suggest to consider new possible functions of traceability. Taking an alternative approach has proved fruitful, raising traceability from the level of a mere labelling means to that of a systemic model.

Both in its goal and its function, traceability must necessarily be used to manage a stream of information, to store data and to communicate them. Intended as a system to collect, organize and process information, traceability should be devised to communicate data according to policies of transparency.

Systems devised to implement both traceability and data sharing of the production chain (but also of the production itself and of the reuse of production scraps) represent a resource capable of facilitating products' communication in a Corporate Social Responsibility perspective. On the other hand, these systems bear the potential to reframe the dialogue within production districts according to systemic design methodology (Bistagnino 2018). This dialogue should be built on the base of circular economy principles and in keeping with broader concerns of economic and environmental sustainability set by the Sustainable Development Goals (UN, 2015). In this sense, our research has focused on the project sustainability regarding both companies and the product-service systems (Ceschin & Gaziulusoy, 2019).

To that end, we focused on the production stage as a whole, including distribution and consumption, in order to understand the value chain both in its elements and in its applications.

Concept Design of Dedicated Traceability Systems Dedicated for Companies

The first workshop promoted the organization of wide knowledge systems built on traceability devices concerning production cycles, but also production and management-related needs. The intended goal was to structure these devices in a project for traceability improvement both in terms of identification of needs and management of final outputs. This workshop was created to encourage a dialog with the companies involved, moving in three directions:

- 1 an internal survey to evaluate the best possible communication devices to be used anew or to improve the company communication system already in use;
- 2 a dialog with potential clients, in order to create and strengthen the value of a Made in Italy product which is *traced*;
- 3 a dialog with stakeholders and the territory of Veneto to add value to the research project itself.

The second stage of our research — after analyzing the existing bibliography on the topic — was mainly based on a firsthand survey. This survey was carried out through an analysis device specifically created for companies. On-site and focused visits to the companies involved provided data which were then used to devise proposals for specific projects. Thanks to these research activities — both quantitative and qualitative — we selected the most suitable strategic areas to place traceability goals.

The results of this second stage of our research clearly pointed to a lack of adequate sustainability strategies. We found that sustainability concerns were regarded as relevant by companies, but this awareness did not correspond to an actual internal organization in terms of dedicated positions and processes effectively highlighting the importance of sustainability. Similarly, insufficient attention was paid to communication projects which could potentially spotlight virtuous practices of sustainable production. A significant gap emerged between sustainability goals perceived as a stimulus towards competitiveness and the implementation of

corresponding strategies. Within this framework, the best way to proceed was organizing a workshop for project development with the companies involved. In this way, companies had the chance to take advantage of scientific insights regarding:

- 1 traceability, especially in relation to certification and brand recognition strategies designed for Made in Italy products;
- 2 design of communication, service and retail.

These workshop activities have been integrated in an effort towards the development and consolidation of relationships within the production chain, but also towards the reduction of discrepancies among different companies in terms of economic sustainability. These workshops enacted the possibility of a concerted effort. Companies were thus involved in the development of a design concept, which would facilitate them in understanding how to act on their own strategic areas, reaching for a specific goal: highlighting and implementing practices of sustainable development in connection with traceability issues. We divided possible projects in four different areas intended as frameworks to develop a specific concept for each company:

- 1 Communicating sustainability of the production chain;
- 2 The afterlife of a compostable product;
- 3 Inside “Made in Italy”;
- 4 Turning production scraps into projects.

On the basis of these frameworks, companies began to devise ways to start development projects in their own context. A group of external consulting agents coordinated the development of projects envisioning two goals:

- 1 implementing the companies' communication of traceability on a national and international level;
- 2 incorporating technological systems allowing for an accurate and prompt update regarding business practices for companies.

This update was considered crucial to improve the control on the production chain, consolidating sustainability and the quality of the products.

Trajectory of Project: From Concept to Development

Starting from the results of the workshop activities carried out with companies, we saw the potential for the development of a specific case study, so as to actualize one of the concepts. The development of this concept was intended as a natural continuation and application of the previous research project, dedicated to the Innovative Regional Network (RIR) Face Design. This project recognized the reuse of production scraps as a possible planning trajectory to investigate the relevance of traceability for sustainability.

A Case Study: Design for the Sustainable Management of Leather Production Waste

The research project financed by the ESF funds of the Veneto Region, in the form of an inter-university research grant involving Università Iuav di Venezia and Università Ca' Foscari di Venezia, concerns the design of production waste between sustainability and digital revolution, and more specifically the *Design of products, systems and services for the sustainable management of tanning production scraps*.

Dani tannery was the designated partner company. Dani has been active in Arzignano since 1950; its business philosophy leads to directing many resources to research, development and innovation in terms of sustainability. In fact, in the Veneto area there is one of the most important districts in the world where big brands can find small and medium-sized enterprises capable of creating products of the highest quality for the international market. Among the research directions of this sector, the problem of processing waste and its disposal plays a significant role. The tanning sector is already strongly committed to constantly searching for innovative methods to reduce the use of natural resources and emissions, in order to improve the recovery capacity of supply chain waste: some treatments make it possible to enhance them as resources, obtaining fertilizers, biostimulants and proteins which are intended for agriculture or for the finishing process (UNIC, 2019).

As a natural continuation and concrete application of the previous research project, the study in progress aims to highlight the potential of a society, a company, a territory and “enhance these elements in order to trigger a change of mentality among people” (Tamborrini & Stabellini, 2018, p. 55), in favour of social, environmental and economic sustainability. This path is implemented through a strategic collaboration between the disciplines of design and those of the economy, which are capable of triggering innovation factors in the design of products, systems and services.

Design is the discipline capable of interpreting technical, economic, social and cultural transformations, coming into close contact with the concrete dimension of the territorial context: once the identity of the local tanning production system has been investigated as a whole, the designers become the “locally enabled terminal” (Arquilla et al., 2005, p. 175) through which design acts on the processes of competitive enhancement of a single firm and of local business systems.

Starting from the assessment of the state of the art and of the good practices on sustainability for reuse, through the analysis of the contexts and conditions of the local and national panorama from the point of view of sustainability, and in particular of the relationship with logic and tools for the enhancement of production waste, we lead to the hypothesis of a research and analysis path that relates to those of leather production and aims at overcoming the notion of production scraps as waste, in favour of a qualification as a material resource.

We want to propose examples and possibilities related to the integration of materials, semi-finished products, or derived from used products, within new design processes mediated by the construction of an interpretative key of the project provided by the expressive-sensorial qualification of production scraps: a conceptual bridge generated from the studies concerning the relationship between materials and design, therefore from the research lines of the so-called *skins* of design and material experience (Karana, 2010), referring to the themes of multisensory, the design of new materials or the innovative use of existing materials, and therefore of the experience one has with these (Carullo & Labalestra, 2018).

Design emerges as a connector of material cultures and as an opportunity to rediscover traditional know-how in the encounter with the most unprecedented ones, in the sense of contextual design — as it is understood at the Design Academy in Eindhoven — with the double meaning of referring to the social and technological reality of their time and to emphasize the changing role that design can play, within specific contexts, pushing research beyond conventional boundaries (Beyer & Holtzblatt, 1998). In this sense, the starting point is represented precisely by the analysis of what each context and territory can offer in terms of identity, history, material culture, through critical reflections capable of combining technology, technique and meanings with the productive realities and institutions of the territory.

Sense Making Material

The research aims to promote the development of Veneto companies in the leather goods sector through the enhancement of production waste and to innovate these processes in relation to the synergy of methods, systems and skills of the disciplines of design and economics.

What has been said is implemented through the assessment of the quantity and quality of leather waste in order to design a waste classification model that is the basis of a system shared by the supply chain, and in order to collect it depending on their qualitative attributes, in the perspective of a reduction in disposal costs. In this way the research activity can generate new design scenarios and prepare the development of a series of indicators measuring the saving of resources through the reuse and recycling of materials. The aim is to highlight the relationship between one's own local cultural identity and the globalized context, and therefore how the processes deriving from the sedimentation of a specific know-how enrich knowledge more and more, taking shape in the sensitive surface of the artefacts.

For this purpose, we think about actions and contaminations, intended as design acts and technological transfers, in order to create an identity tool for the company in which the designer works and whose production processes he knows: a system of specific cataloguing as a service and design mediation tool, to enhance the scraps through the application of a specific method based on the definition of expressive-sensorial parameters. The expressive-sensorial qualification of materials, alongside the technical-performative one, requires a humanistic-sensitive reading relating to sensorial perception and to the experience one has with them (Carullo et al., 2019; De Giorgi et al., 2020) and represents the conceptual filter on the basis of which

a specific mapping method has been built. Therefore, overcoming the “neutrality” of those expressive-sensorial characters, in order to elaborate an interpretative key of the project (Carullo et al., 2019, p. 156), the hypothesized cataloguing system takes shape in a talking map. A sensory map, understood as the construction of perceptive paths that embody the “sensuous assemblages” (Bruno, 2015, p. 19) of the material interactions carried out with scraps — designed and designable —, at the same time a temporal map, as a trace of the succession of the process phases, and a matrix map of the design possibilities generated by the designed actions and material contaminations.

Each phase of the production processes identified by the mapping of a specific know-how, in this case the tanning one, constitutes “the intersection point of the meshes of a network in which we intend to capture the generic notion of identity of the territories to deposit it in individual artifacts” (Carullo & Labalestra, 2018, p. 100), and therefore it is a constituent element of the map. In this way, production scraps, which are the material outcomes of those processes, can become resources with their own design dignity within the culture of design.

The construction of a map of sensory gradients therefore allows for a “sensory movement” (Bruno, 2015, p. 266) which is also a movement in the mutations of matter itself and simultaneously generates an organization of perception and an organization of design possibilities, following a further conceptual movement between sustainability, sensoriality, identity and recognizability.

Being a matrix of possibilities typical of a certain territorial culture, this tool becomes a medium of communication and strengthening of an identity know-how, in the specific case that of leather processing, whose waste become evidence and design matter.

The material-sensorial-process map then acts as an identity planning tool of the territory, with the purpose of optimizing local resources and supply chains and enhancing the positive effects on the territory itself and on the local production system.

Design for Territorial and Environmental Capital

The specificity of the productions of the Veneto area emerges as an element of strong competitiveness. The reciprocal exchange between university and territory is fundamental to contribute to the understanding of specific contexts through culture, tools and possible design variations that can trigger sustainable processes.

Local systems are frequently “based on extra-economic factors, of a social and historical nature, on contextual knowledge, [or] on the complex and articulated system of skills and know-how generated by the explicit or tacit transmission of knowledge” (Bassi, 2018, p. 14). Innovation, therefore, can not be confined to the internal areas of research and development of companies, but must necessarily open up as an activity capable of expanding increasingly to a wide range of transdisciplinary methods, relationships and collaborations. It is above all from the relationship with the territory that a way of characterizing processes and outcomes emerges to mark its pe-

cular identity. This contribution testifies to the exploration of new territories of knowledge and the ability of design to adapt to context as the first form of sustainability.

Starting from these premises and so that the territory can absorb values such as sustainability, identity and recognition, the desirable change has a cultural nature. This change should make the company aware of the potential and the design tools triggering processes of innovation and creation of added value in terms of meaning.

If the overall target of the two experiences presented was to transfer skills, that is to say the result of a work of synthesis and elaboration in the context of an inter-academic sharing process and enriched by the contribution of companies, then in a perspective of anticipation, the design directions developed in the form of a concept can become a lever for technology transfer.

The so-called third mission of the university is thus shown through the coordination of a common development strategy based on interventions that identify and explain the current tacit mechanisms to generate and codify a clear circuit of innovation, in the belief that it can be exploited as a driver capable of supporting strategic innovation within a specific district or a territorial context.

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