

ARCHITECTURE HERITAGE and DESIGN

Carmine Gambardella

XVI INTERNATIONAL FORUM

Le Vie dei  
Mercanti



**WORLD HERITAGE and KNOWLEDGE**

Representation | Restoration | Redesign | Resilience

**ARCHITECTURE HERITAGE and DESIGN | 2**  
Collana fondata e diretta da Carmine Gambardella

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Le Vie dei Mercanti  
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**Conference report**

300 abstracts and 650 authors from 36 countries:

Albania, Australia, Benin, Belgium, Bosnia and Herzegovina, Brasil, Bulgaria, California, Chile, China, Cipro, Cuba, Egypt, France, Germany, Italy, Japan, Jordan, Kosovo, Malta, Massachusetts, Michigan, Montserrat, New Jersey, New York, New Zealand, Poland, Portugal, Russia, Slovakia, Spain, Switzerland, Texas, Tunisia, Turkey, United Kingdom.

160 papers published after double blind review by the International Scientific Committee

## Preface

*In the present era, technologies are becoming increasingly important in helping and supporting man in research, knowledge and production activities, almost as if they were smart prostheses. With the theme of the XVI Forum “World Heritage and Knowledge”, I propose to the International Scientific Community to debate and establish a comparison of knowledge carriers to communicate methodologies of good practices adopted and experiences in the use in the protection, conservation and safeguarding of cultural heritage and landscape as well as in the design of the “new, ”that, adopting in the building processes and building construction Innovative Building Modelling, can realise a non-contemporaneity of what has the same date (Giulio Carlo Argan) respectful of the values of the pre-existing, legitimate because it participated ex ante and monitored becoming all its ethical, aesthetic and performance connotations.*

*With the Internet of things, for example, sensors that are used to produce data autonomously that widen the processes of knowledge on all levels, from the territory with its infrastructures, to the environment, to the artefacts entering into the body itself of their physicality, or, in the case of the new, building the project as a prediction throughout physical consistency.*

*Nevertheless, the use of new technologies allows for economies of scale, both temporal and economical, not only for the surveying and representation of the built and the territory in the analysis phase but above all for the management of the resulting data that makes the design activity of the restoration of the historical heritage and landscape or of the newly constructed in a single process no longer divided into steps but also unitary in concrete constructions and the realisation of the works, in the intermediate checks, in the testing, in the monitoring and in the programmed maintenance.*

*In conclusion, it is indispensable for the scientific community to highlight how technologies, without a responsible attitude that commit man’s choices and knowledge in dealing with and planning appropriate responses to the issues and needs of the collective, can create a deception that unfortunately materialises with the subtle persuasion of uncontrolled astonishment that overwhelms the imagination.*

*Carmine Gambardella*

*President and Founder of the Forum*



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## Local identities & excellences

### An industrial network to re-produce uniqueness through waste reutilization

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#### Abstract

The aim of this project is a study of feasibility that allows to start up the experimentation and the consequent introduction of some innovative methodologies in the managing of the leather production waste, the waste produced during the cutting process.

The leather production sector, takes on great importance in the Italian economy. More than 1/4 of the national production and about 1/5 of the whole E.U. production is made in Tuscany. For this reason, our study will be based on the Santa Croce sull'Arno leather district and will theorise some guidelines that can also be adapted to other districts.

The tanning industry gives a high "added value" material to a series of initial production chain, in particular in the fashion and design sectors (interior design, transportation design). The skins waste material is today considered a special waste according to the CER 04 01 08/09 codes. This waste is mainly produced during the leather cut process and at the moment it is disposed of in different ways. The present study is aimed to make the leather production waste a secondary raw material for new materials/products, representative of a local identity, to put onto the market and to get to a "zero waste" production chain cycle.

**Keywords:** Leather, Recycling, Eco-design, Fashion, Network

## 1. Context

### 1.1 From Made in Italy to Made in Tuscany

The expression Made in Italy contains all the Italian manufacturing production made of excellences, know-how and traditions bond to its territory and worldwide acknowledged. Industrial districts (IDs), a cluster of interconnected companies, mainly SMEs, operating in a small geographical area are a phenomenon of Italy. Specifically, Italy has found in this organisational model a peculiar trait of its economy and a relevant source of socio-economic development and growth. The industrial districts are characteristic elements of the Made in Italy production; they are homogeneous local productive systems characterised by a high concentration of micro/small and medium size companies with a high productive specialisation. This kind of organisation allows to divide the productive cycle into different phases; each phase is entrusted to independent companies which are part of the same geographical and productive net. This allows a high organisational flexibility and at the same time economies of scale that can make the finished product highly competitive, even in comparison with the product of bigger companies. Santa Croce sull'Arno is one of the Tuscan districts spotted by the Regional Decree 69/2000 (starting point of our study in order to define a net model to adopt in other contexts); it is situated between the provinces of Pisa and Florence and it can boast companies specialised in the whole leather production chain, from the tanning to the finished product, both in the shoes sector and in the leather industry (bags, clothing etc.).

Other important leather districts are: the Valdinievole district, specialized in footwear, the upper Valdarno district where an extensive network of medium size companies is connected with big companies of Tuscan origin (Prada, Gucci and Ferragamo) and with international brands (Fendi, Louis Vuitton, Chanel, Dior and Céline) and the Castelfiorentino industrial district (leather, hide and footwear). The textile-district in Prato is one of the biggest Italian industrial site and one of the most important worldwide centers in the field of yarns and woolen fabric. The textile and clothing district in Empoli, the third in Tuscany as for its dimension, and the Casentino and Val Tiberina textile and clothing district, situated in the province of Arezzo, which is famous for its Casentino cloth. The goldworking district, based in Arezzo, can boast a production that from the 70s up to now has ranged from modern and old style top jewellery to fine goldworking without stones, up to tableware sets and home decorations. The Capannori paper district, situated between the provinces of Lucca and Pistoia, holds 80% of the paper national production and about 40% of the national corrugated carton production. There are also a lot of manufacturing and service enterprises, connected with the paper production chain, in the mechanical, electrical and electronic sector, with a strong vertical integration of the production cycle. The Poggibonsi wood and furniture district's strength is the production of kitchens, furniture and accessories and it can boast some successful top design companies. Besides the furniture sector, there are enterprises ranging from caravanning to mechanical, getting to the famous marble mining and working district in Carrara.

As Tuscany fulfils one fourth of the tanning national production and one fifth of the EU whole production, our study will be based on the Santa Croce sull'Arno tanning district and will theorise some guidelines that can also be adapted to other districts.

### **1.2 The tanning district in Santa Croce sull' Arno**

The leather art in Tuscany is a secular tradition that dates back to the Middle Ages. The first important tanning settlements go back to the beginning of the 1800, but only after World War II this activity expands and becomes a part of the existing urban context, getting to its maximum development in the '70s. The Tuscan tanning district is the second in importance (after the Veneto region) and its distinction is due to the style of its craftsmanship production, mainly intended for the high fashion sector. The fashion production chain (shoes, leather goods, clothing) is the main customer of the Italian tanning companies, with more than 80% of the production absorption. In more detail the shoes sector is historically the main recipient of the national leather (42% of the total tanning production), followed by the leather goods sector (25%), upholstered furniture (16%), car interiors (10%) and clothing (5%). [Data from the 2015 annual report of the National Union of Tanning Companies]. A little more than half of the Santa Croce production is intended for the national market, while the remaining part is intended for the exportation. The number of the destination markets is increasing: besides the European markets, that take about half of the export, there has been an expansion to the North American and Asian markets. In the past difficult International context, that has badly affected many economic sectors, the Tuscan tanning companies have endured better than other companies that have a similar production and the same market destinations; and even if they have been affected by the standstill of the international demand, they have been able to recuperate during the economic upturn. In the present phase, in which we can see some positive signals coming from the overseas markets, the district strength will be appreciated for its ability in competing on the quality, design and making of a diversified product, often upon final customer's request, able to foresee the national and international fashion trend. A highly characterised product that can express its uniqueness through all those intangible values that connect it with its territory (the "ambient" asset is becoming an important factor of competitiveness, an intangible added value to the Italian production). All these factors have permitted and will permit to the Tuscan sector to overcome difficult phases and to cope with the worldwide competition, that is often based on low cost production processes and not very keen on the environmental protection.

### **1.3 Characteristic processes**

The tanning production process is made up of a series of chemical and mechanical workings whose nature and sequence can vary considerably depending on the kind of leather and the final product. Every year a tanning firm's production includes hundreds of articles and these can vary according to the season and the market demands; as a consequence of this, the production process go through continuous changes and/or improvements.

Traditionally, the production process can be divided into the three following phases:

- preliminary workings and beamhouse process;
- tanning process and dyeing process;
- post-tanning finishing operations.

The skin that undergo a tanning process is composed by three parts:

- the epidermis, that is the outer layer (the fur);

- the dermis, that is the 85% of the remaining thickness and is important because it will become the finished product. It is made up of an upper layer, called the flower, and a lower layer, called the crust;
- the subcutaneous tissue, that is about 14% of the whole raw-skin, it contains fats and proteins and it is removed during the first steps of the process.

When the raw-skins arrive at the tanning firm, they go through a conservation treatment, in order to slow down its decomposition and to keep them in good conditions, until the working process starts.

There are two tanning processes: the chrome tanning and the vegetable tanning.

The chrome tanning is still the most common system all over the world, because it permits to produce almost all kinds of leather and because its production is cheap, functional and it can be easily integrated in the computerized processes. The chrome tanned leathers, called “wet-blue”, are intended for the clothing sector and for the shoes’ vamps sector. The vegetable tanning is carried on through the use of vegetables tannins like chestnut, mimosa, etc. that give a peculiarity to the finished product. The vegetable tanning can be aimed at the production of hide for shoes soles or the production of leather goods like belts, bags and recently also vamps for shoes. The high technological standards of the companies in this sector, have allowed not only to improve the quality of their products, but also to widen their range. At present the district can process all kinds of skins, including bovine, ovine and reptile skins. This has enabled the district to satisfy the “fashion” side of the demand, characterised by a production based on small lots, high quality, not standardised products and fast delivery times. It very often happens that the district itself can anticipate the fashion trends combining its centuries old experience with evolution, technology, inspiration and creativity.

#### **1.4 Type of waste**

The disposal of the leather waste has produced in the last years a special waste, according to the CER 040108 code (tanned hide, waste, cuttings, powders originated from the polishing process and containing chrome) and the 040109 code (waste coming from the operations of making up and finishing). All this waste is mainly produced during the leather cutting process in different quantities and qualities and at present it is disposed of in different ways. An inductive estimate based on a survey carried out by the body Quadrifoglio, assumes a yearly waste of about 1700 tonnes. But we do not know anything about the expenses for the disposal of this waste, that actually could find a more natural position as material of reutilisation or by-product. However, an important contribution to the matter could come from a direct recycling of the waste coming from the production, during the production process itself. That is not news, but not always the most economical conditions can be found. Today the general increase in price of the raw materials is an important incentive in the evaluation of any possible saving solution.

However, if we examine the problem from the point of view of a manufacturing company that produces waste, we immediately realise that the many technological or dimensional restrictions often leave a company no solution but disposing of it. In the best case the waste can be reused, reworked and mixed with other raw materials. Considering these data, it is clear how important this sector could be and consequently how it would be necessary to make some interventions aimed to support the small/medium businesses in the leather production chain and to find a new way to give value to the product, thanks to a cooperation with similar companies (but not only) interested in the reutilisation of the waste, that could thus become an “added value” to some products.

## **2. Methods**

### **2.1 Research phases**

The aim of this project is a study of feasibility that allows to start up the experimentation and the consequent introduction of some innovative methodologies in the managing of the leather production waste, the waste produced during the cutting process.

Our analysis is aimed to make the leather production waste a secondary raw material for new materials/products to be put onto the market, (possibly also in other sectors) in order to get to a “zero waste” production chain cycle. This prospect intervenes directly on the possibility of reusing and recycling the waste locally and it could lead to a waste reduction, in particular of the waste that today is not intended for recycling but only for disposing of; in this way there would be clear advantages for the environmental impact.

In order to reach the above mentioned objectives, our research has been divided into the following three phases:

Phase 1

The first phase consists of an economical-environmental analysis, aimed to focus on the real dimension of the situation in terms of quantity and leather waste disposing costs, according to the current regulations.

Actions

A1 In this phase there has been the analysis of the data of the main Tuscan, National and International associations. In particular: Associazione Conciatori of Santa Croce sull'Arno (PI), Consorzio Conciatori of Fucecchio, Consorzio Conciatori Ponte a Egola, Consorzio Vero Cuoio, Consorzio Vera Pelle Italiana Conciata al Vegetale, Unione Nazionale Industria Conciaria, Cotance - European leather Associations, Conseil National Du Cuir, China Leather industry Association (CLIA), Leather Industries of America, U.S. Hides, Skin and Leather Association, Associação Portuguesa dos Industriais de Curtumes, Verband Des Schweizerischen Leder, Verband Schweizerischer Gerbereien, Federatie van Nederlandse Lederfabrikanten, Türkiye Deri Sanayii İşverenleri Sendikası.

In the districts, the concentration in regional areas, the small business dimensions and the homogeneity of some situations, have been an incentive for the environmental matter. Thanks to the cooperation between the Consortiums and the Public Bodies, there has been the realisation of the following:

- purification centralised plants;
- new equipped industrial areas;
- plants for the recycling of the working's by-products;
- plants for the reuse of the purification's waste muds;
- a consortium plant for the extraction and reuse of the chrome III;
- the Technological Tanning Centre for the vocational training and research.

A2- In order to know better the problems connected with the leather production waste, the sector operators have been given a questionnaire to answer.

A3- Workshops and local tours at some small/medium Tuscan companies have been organised (Legnotan in the tanning sector, LogicArt in the marble sector and Up to Be in the textile sector). In this occasions some experts have explained their production processes and the problems related to the disposal of the waste.

A4- Spotting of the product categories for which the waste could be reused.

A5- In order to find new uses of the waste, there have been some meetings with the main Italian companies in the field of the solar filters frames and ophthalmic lenses (Luxottica, Safilo ...) in cooperation with La.Mo, the frames laboratory of the University of Studies in Florence.

The second activity was intended to spot some guidelines that could be used not only in the Tuscan tanning district, but also in other business contexts.

## 2.2 Re-producing uniqueness: case study

The analysis of two model –experiences has been essential in our research. In fact, in the light of the waste reutilisation, we have got to some interesting results: re-producing uniqueness thanks to some creative interventions able to blend the industrial and semi-industrial production systems with the small systems.

Case study 1: OneOff by Richard Ginori

During the fair Maison&Objet, the designer Paola Navone from Turin, has made some unique pieces, to buy by weight, out of the flawed or out of production china by Richard Ginori. The Tuscan company has been able to relate to the design sector and to involve designer Navone in a project that is very interesting not only for its decorative results, but mainly for its idea of valuing a flaw and giving a second life to materials that were supposed to be disposed of. *"I have taken 1000 kilos of flawed and unmatched white porcelain and in a month's time I had it decorated with decalcomanias' fragments, brush strokes and colour spots. A metamorphosis that has given a second life to a product and has brought to a new method of sale; unique pieces sold by weight, (at the Merci concept store in Paris) like offcuts stockers: everything was sold out in 15 days'time"*.

Case study 2: The Meat Project, developed by Atelier Monté

In this project , a Belgian designer that lives and works in Rotterdam, analyses the food waste, focusing mainly on the meat waste. He has used expired meat coming from supermarkets and has decellularized it in a laboratory. Thanks to this procedure, that is at present the most used in the textiles regeneration process, meat loses all its cellular part, becomes almost milky white and stringy. As soon as this process finishes, the material obtained becomes highly moldable and can be used to make design objects and home decorations.

## 3. Results

### 3.1 New synergies

In Tuscany, more than in the rest of Italy, the leather sector, the hide sector, the textile sector and the clothing sector are considered "excellences".

Tuscany is a region characterised by some of the general Italian economy factors and also by other factors that on their regional territory become more important; it is a region aimed to the international trade, thanks to the fashion sector. But Tuscany has gone beyond: among these commodities sectors



there are some synergies that, thanks to small/medium companies networks, can create know-how and excellences connected with its territory.

In fact, it is the creation of an industrial network that has given value to the Tuscan product, that is to say communication between different but complementary companies. The high specialisation and organisation of the work has been granted by a reciprocal exchange of products, know-how and competences; the exchange of know-how and products becomes a fundamental principle of growth of all the “actors” involved in the process. Unlike those countries where the production costs are dramatically low (manpower, energy, taxes) only innovation, trends anticipation, but mainly the importance of a territory and the opening to the external contributions, can collocate the “Made in Italy” production one step ahead of other countries.

Today, more than it used to be in the past, it is important to have a wider view of the added value, given by the productions that involve different entrepreneurs in the same territory; an effective network that is able to grant a systematic, multi-dimensional and multidisciplinary innovation, as it creates synergies between different realities (industrial-craftmanship, innovation-tradition, etc.)

We can assume that the small/medium companies need to comply with the market deep change: that is to stand out of the crowd and become an excellence, defend the quality of their own products by using technologies and being innovative, but mainly including in their business relations similar or complementary companies and create with them business networks or partnerships.

The partnership is in fact a good means to connect with other companies and the Italian small/medium companies should activate this co-investment involving one or more market variables in order to obtain more benefits in the approach to their own market sector. A partnership can be vertical if there is a hierarchy between the bodies, organisations and companies involved, while it is called horizontal if there isn't a substantial difference between the actors involved.

The present study has spotted vertical and horizontal partnerships. In both cases the aim of these “virtuous alliances” has been to support the small/medium companies in the management of the waste produced during the production processes through the formulation of some guidelines tailored to the different regional experiences.

### **3.2 Uniqueness as added value**

In accordance with the laws of the market, uniqueness is a value that defines the price of a product. The more the offer of a product reduces, (getting to the limit case of one-of-a-kind, as it happens for the pieces of art), the more the price is not affected by the confrontation with other objects of the same category. That is because rarity and not quantity has got an inestimable intangible value. But uniqueness is not only morphological differences. There is also another immaterial uniqueness, connected with some intrinsic intangible worths. The focus shifts from aesthetic reasons to reasons connected with the same “life” of the object, (e.g. the value of its use). Uniqueness is in fact a different way of placing an object in its own context, from its sale, to its use. If we consider it in more detail, today the value of a product is not only determined by a different shape, but it lies more in the ability of re-shaping these identities and re-producing the uniqueness of a product in its local identity.

There are two modalities that bring to the creation of a kind of “Genius loci” in the light of contemporaneity and globalisation:

- vertical partnership: small/medium company + big company
- co-branding: small/medium company + small/medium company

In both cases these operations of ecodesign or design are targeted to an environmental sustainability: from the waste (that is often small waste in the leather sector) to traditional products but with an added value and even to new kind of products.

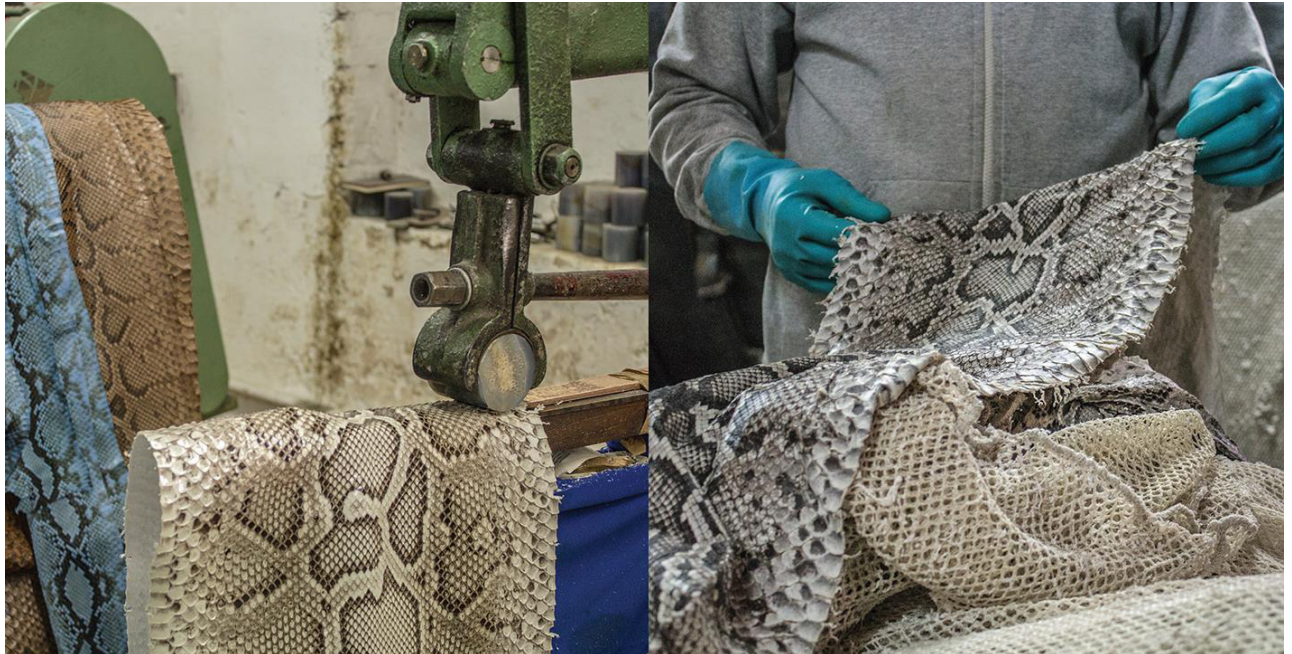
### **3.3 Conclusions**

The Italian product is very rich in intangible values and cultural meanings that have their roots in their own territory, in the social context and in the strengthened techniques. It stands out of the international landscape thanks to the quality of its forms, its care of details, but also the shapes and materials taken from its territory. The Italian product, characterised by a product-territory symbiosis, expresses its own human, social and historical values through a blend of intellectual and tangible knowing that eventually becomes know-how.

The present study (whose main objective has been to support the small-medium companies in their search for new synergies, innovative and “unique” products obtained from the waste of their production) has enabled to pilot projects that will test the feasibility of this organisational model and the possibility of using it also in other contexts.

These projects have given birth to co-branding partnerships and to partnerships between big well structured companies and small-medium companies. The ethicality of this project is based on the

realisation of products with a high added value, given by their uniqueness and by all those intangible aspects that connect it with a territory and its unique traditions.



**Fig. 1:** Post-tanning finishing operations of reptiles leather.

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