

Autochthonous Materials and Traditional Manufacturing Methods: Analysis Based on Cultural and Historical Features

Aline Souza^{1,2(✉)}, Rita Almendra², and Lia Krucken³

¹ FAUeD, Universidade Federal de Uberlândia, Uberlândia 38400-902, Brazil
aline.souza@ufu.br

² CIAUD, Faculdade de Arquitetura, Universidade de Lisboa,
1349-055 Lisbon, Portugal
almendra@fa.ulisboa.pt

³ Escola de Design, Universidade do Estado de Minas Gerais,
Belo Horizonte 31270-010, Brazil
lia@liakrucken.de

Abstract. In Brazil, there is an abundance of materials resource. Immensely, natural resources, native materials and traditional manufacturing techniques form them. However, the lack of articulation among producer community, companies, development policies in association with a poor projectual speech implies reduced use of local resources and, consequently, results in losses of opportunity to add value to local resources and developing local economy. Discuss and propose strategies for adding value to territories is very important for practitioners and researchers that work in the area of product design. Starting by the question – could a material or manufacturing method enable recognition of places and empathy by users? – We made use of a survey based upon questionnaires, answered by 60 people to find evidences of aspects involved in this relationship. They indicated products or brands made by materials or manufacturing methods they judge related to a place. This paper presents the result of analysis by historical and cultural perspective view based on documental review.

Keywords: Design and materials selection · Intangible meanings of materials · Design and promotion of local resources · Cork · Golden Grass

1 Introduction

Over the last decades production systems have acted globally: A product can be designed at some place and be built in other country with abroad materials or foreign technologies; this same product still can be sold everywhere. However this situation is critical to emergent places. According to [1], this reality is devastating because large companies have no responsibilities with social or environment aspects; they just obtain profits until it attends.

Beyond economic and social injuries, [1] defends that the concentration of economic supremacy and massive production had been also injuring environment.

[2] advert that large industrial systems discharge amount toxic waste on air, soil and water; causes intoxication to people and natural systems; produce dangerous materials; produces useless waste; buries materials. These production systems can improve and develop several aspects of places: environmental, social and economical.

The productive capacity from places can boost several benefits to them. It is possible to say some materials or some manufacturing methods are linked to history and tradition of territories. The way things are made can say something about its people and its place. In the meantime, some natural matters (what gives origin to a material) grows up exclusively in specific regions, they are singularly transformed in material in specific regions.

Moreover, traditional manufacturing methods or ancestry techniques used to build objects are current in the cultural history of societies. According to [3] crafts can be used as example: some territories can be represented by iconic elements from crafts skills developed by societies; some places still have their names associated to one of these crafts activities.

Brazil is an immense country and owns vast natural resources. Moreover, ancestry communities developed a lot of traditional manufacture methods. However, traditional manufacturing methods are not registered, and it exists a serious risk of they disappear. Rarely, large companies use traditional manufacturing methods and natural materials. Frequently, traditional manufacturing methods and natural resources are exploited by craft and usually results in low quality products. Emotional aspects of materials and manufacturing methods are not employed. Profits generated by massive production do not stay in territories of the materials or manufacturing processes. Design education almost ignores this type of source.

In 1986, the book “The material of invention” [4] presented materials and manufacturing processes as a “horizon of possibilities” for designers. Author explained technical features should not be principal criterion to select a material against an increasing number of new materials. Then, he realized reflections about cultural aspects of materials and its effects at users perception of products.

From then on, lots researches investigate the role of sensorial, emotional and perception aspects of material in user-interaction relations. These aspects are called by experts “intangible meanings” since they are subjective [5–11].

Starting by “materials evoke meanings and elicit emotions” [11], some material or manufacturing method employed in local products can evoke emotions in users. Among others, intangible aspects of materials are relevant to this research because it is concerned with factor of local recognition.

Recognition of territory is an essential factor for adds value to its resources. Then, as [12] arguments local qualities should be presented and exploited when gives value to local resources is expected. For author, local products can do this quality recognition. Beyond the history and culture of some place influence original design of products.

The purpose of this paper is to present a study about cultural and historic aspects of materials appointed by users as representative for places. It is important for designers and practitioners from local design field understand relevant aspects for users and their products appreciation, once recognition of local values is crucial for success of local products. The main objective of this study is to evaluate and list what kind of relationship materials have with history and culture of associated place.

To realize this study it was needed new information about users and their appreciation of local products. Then, it was chosen Survey as method for this data gathering. Following, based on responses it was realized a Documental Analyzes to find the role of them in history and culture of places they were associated by inquired individuals. Next, analysis grids of finds have been built to classifies and compares them. Based on analysis grid a list of relevant indicators was shape.

The survey firstly aimed to verify if users can recognize places by constructive aspects of products. It was based upon questionnaires, answered by sixty undergraduate students (thirty from Brazil and thirty from Portugal). This study was not boarded to a specific user, then the sample was chosen by convenience. Questionnaire had only one question that asked if the inquired people could cite any product or brand which uses native materials or local manufacturing techniques.

Most of Brazilian inquired individuals indicated at least one industrial product, brand or craft artifact which uses a material or a technique that make them realize associations to a place. Only two inquired individuals answered they could not remember any product or brand. Citations were extremely varied. Some responses were cited more than one time. Most cited products were art crafts from northeast of Brazil made by bobbin lace, indigenous pottery from Brazil, products made by cork from Portugal, objects made by golden grass from Jalapão and products made by murano glass from Italy. Figure 1 generated by Wordle System shows the proportion of responses.

Most of Portuguese inquired individuals indicated at least one industrial product, brand or craft artifact which uses a material or a technique that make them realize associations to a place. Only three inquired individuals answered they could not remember any product or brand. Citations were very similar to each other, mainly Portuguese products were cited. The majority of responses were cited more than one time. Most cited objects were cork from Portugal, pottery from Caldas da Rainha,



Fig. 1. Answers by Brazilian inquired individuals

this reality, many artisans from other Brazilian regions moved out to Tocantins to learn and work [13].

Several types of products are made by Golden Grass: purses, jewelry cases, rings, necklaces, bracelets, bowls, decoration utilities, baskets and others (Fig. 3). Originally, products were stitched with Buriti thread, other natural material from Brazil. Actually, most of products are stitched with metals or other synthetic material because of high prices of Buriti. The formal and finishing qualities are low in many cases.



Fig. 3. Golden Grass products

4.2 Cork and Alentejo

Cork is a suberous parenchyma which involves the Cork Oak tree. Cork Oak tree mainly grows up at Mediterranean European and North of Africa, however, Portugal has the most extensive Cork Oak tree forest of the world. Law in Portugal saves Cork Oak since Medieval Age because of its social, environmental and economical importance for the country [15].

Cork Oak forest is called in Portugal “Montado”. The Montado is the main characteristic of Alentejo landscape. The abundance of Cork Oak reflects on the abundance of Cork. Portugal produces 60% of Cork global production. In Portugal, there are 637 businesses, which employ 8591 workers in this field [15].

The Cork Oak can live 350 years and permits, in average, 18 Cork extractions. Material is natural and renewable. It is necessary specialized work force to make the extraction. After, Cork is used to build various products: stop for bottles, furniture, coating plates, utilities for house, toys, clothing, shoes and others. Cork arts crafts are found among all Portugal territory [16] (Fig. 4).



Fig. 4. Cork products

Some parts of historical monuments are made by Cork and other monuments picture the use of Cork over the Portugal history. In 2010, the Portugal Pavilion at International Exposition of Xangai was completely coated by cork with the goal of demonstrate national politics for sustainability [16].

Although they are few, there are some initiatives on design field exploring Cork and its potential for contemporary and innovative products. New technologies for novel applications and monetization have been regularly investigated. These experiments resulted in viable Cork products such as synthetic composites, expanded plates, Cork skin, Cork paper and Cork textile.

5 Results

Grounded on documental review, it was specified themes, categories and relation indicators for content analyze. Themes were divided in Golden Grass in Jalapão and Cork in Alentejo, the object of analyze. Categories were divided in kinds of material transformation, which are interesting for product design. Relational indicators were established based on historical timeline and the anthropological definition of culture. According to [17] the term culture is used to summarize: knowledge, belief, art, law, behavior and other capacities or habits acquired by individuals members of a society. In anthropological view, these capacities or habits define the concept of otherness that means the difference in relation to the other [18]. All of those capacities and habits together define the identity of a place and generate the place's identity [18]. Then, it was assembled an analyze grid to be possible to analyze the role of material in culture and history (Tables 1 and 2).

Table 1. Golden Grass in historical and cultural aspects of place.

Category	Relation indicators				
	History	Everyday habits	Arts	Behaviors	Capacities
Material on natural landscape	Golden Grass is an autochthonous specie	Preservation of landscape is practiced	Poetry, music, photography and paint	Golden Grass is harvested only from September 20th to October 10th	Local techniques for preservation of Golden Grass plant
Gross material	No information	Harvest was initially taught for next generations. Now it is documented	Poetry and music	Party one day before Golden Grass harvest	Special skills to harvest the twigs
Craftwork	Before 1920, Xerentes indigenous tribe made it for them. After 1920, disseminated by Mumbuca community. Since 1999, it is made buy other communities from Tocantins	Before 1999, only women crafted. Nowadays, men and woman do it daily. Initially, manufacturing techniques was taught by parents for children, nowadays there are limited courses for interested artisans. On Mumubuca community people craft together	Art crafts and photography	Before 1920, use of Golden Grass products in domestic activities. After 1920, use of Golden Grass products a means of subsistence and later as a profession. There are points of sale of handicrafts throughout the region	Special skills to build pieces
Mass production	After 1999	Associations organize craftwork. Even handcrafted, pieces are made in series for exportation	Art crafts and photography	Professional activities	Special skills to build pieces for mass production, to manage production and exportation
High technology transformation	No information	No information	No information	No information	No information
Other alternatives	After 2000	Associations organize craftwork. Even handcrafted, pieces are made in series for exportation	Art crafts and photography	Professional activities	Use of metals, golden-plate, precious stones and other crafts techniques to improve production

Table 2. Cork in historical and cultural aspects of place.

Category	Relation indicators				
	History	Everyday habits	Arts	Behaviors	Capacities
Material on natural landscape	Cork Oak is autochthonous specie	Cork extraction; Livestock activities	Painted Montado landscape Sculptures about Montado landscape	Pastoral activities and hunting	Local techniques for: Cattle breeding; Preserve the Cork Oak
Gross material	Since Medieval Age (registered)	Products used in rural places. Use of cork gross products in domestic activities	Sculptures from XVIII; Architecture elements of building from XV, XVI	Pastors used Cork trough and Cork jug to drink water in the Montado	Local techniques for initial phase of Cork getting: extraction and preparation
Craftwork	Since Medieval Age	Crafts workers crafts daily. There are pieces of various types of complexity, applications and quality of finishing	Various types of handicraft products	There are points of sale of handicrafts throughout the country. They are mainly sold for tourists	Special skills to build pieces
Mass production	Since 1920	There are 637 employments that generate more than 8000 jobs. Cork products are present in Portuguese daily live: cover plates, utilities and stop bottoms and others	Sculptures of stop bottoms	Cork for heat or cold insulation in public places. Cork for posting messages. Cork in kitchen objects	Specialized workers
High technology transformation	Since 2000	High technology crossing traditional manufacturing methods with Cork is used in daily life, for example expanded Cork and synthetic composites are applied in several viable products. New technologies have been regularly tested	No information	Expanded Cork blocks are widely used to insulate cultural events in open areas	Specialized workers
Other alternatives		Paper and Cork skin	Art with Cork paper	Clothes, shoes, fashion accessories and cork stationery are increasingly in use	Specialized workers

6 Final Considerations: Opportunities

This paper presented the results of an exploratory documental analyze about the relation of materials to their origin places. Considering the losses of identity and territories prejudices generated by actual production systems, the understanding of these relations is fundamental to design activity and creation of original and innovative local products.

Some considerations relevant to design of local products can be pointed out:

- Materials are relevant components on user-product interaction.
- According to survey's results people can associate materials and manufacturing methods to places. They cited several cases of products, brands, materials and manufacturing techniques related to territories.
- Artisanal and semi-industrial products were easier to remember, since they were the most cited.
- Portuguese individuals cited more products and brands from Portugal than Brazilian individuals cited Brazilian product or brands. Strategies to Brazilian recognize the value of local products and policies to Brazilian local product improvement are needed.
- Natural and autochthonous materials also were easier to associate to places than industrial materials.
- The evident relationship of Golden Grass and Cork and local history and culture were decisive to their recognition as local materials.
- Both materials help to tell the place history and are present in daily life of local individuals.
- Both materials support their territories economically.
- Both materials enabled the development of management techniques, production and organization, recognized as the "culture of doing" of each one of them.

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References

1. Santos, M.: Por uma outra globalização: do pensamento único à consciência universal, 6th edn. Record, São Paulo (2001)
2. Braungart, M., McDonough, W.: Cradle to Cradle: criar e reciclar ilimitadamente. Trad. Frederico Bonaldo. Gustavo Gili, São Paulo (2014)
3. Albino, C.: Editoria: Design, artesanato & indústria. Editoria: Design, crafts and industry. Fundação da cidade de Guimarães, Guimarães (2012)
4. Manzini, E.: La materia dell'invenzione. Arcadia Edizioni, Milano (1986)
5. Sapuan, S.: Knowledge-based system for materials selection in mechanical engineering design. Mater. Des. J. **22**, 687–695 (2001). Elsevier, London

6. Ashby, M., Johnson, K.: *Materials and Design: The Art of Materials Selection*. Elsevier, Oxford (2003)
7. Rognoli, V.: *The expressive-sensorial characterization of materials for design*. Ph.D. thesis. Politecnico di Milano, Milano (2004)
8. Lefteri, C.: *Como se faz: 82 técnicas de fabricação para design de produtos*. Blucher, São Paulo (2009)
9. Zuo, H.: *Sensory interaction with materials in product design*. Ph.D. thesis. Solent University, Southampton (2003)
10. Van Kesteren, I.: *Selecting Materials in Product Design*. Tu-Delft, Delft (2008)
11. Karana, E.: *Meaning of materials*. Ph.D. thesis. Tu-Delft, Delft (2009)
12. Krucken, L.: *Design e território: valorização de identidades e produtos locais*. [Design and territory: adding values to local identities and products]. Studio Nobel, São Paulo (2009)
13. Schmidt, I.: *Etnobotânica e ecologia populacional: sempre-viva utilizada para artesanato no Jalapão, Tocantins*. Master thesis. University of Brasília (2005)
14. Belas, C.: *Capim Dourado: costuras e trançados do Jalapão*. IPHAN, Rio de Janeiro (2008)
15. APCOR.: Videoteca. <http://www.apcor.pt/media-center/multimedia/videoteca/>. Accessed 13 June 2014
16. Mestre, A.: *Cork design: a design action intervention approach towards sustainable product innovation*. Tese de Ph.D., Universidade de Delft, Delft (2014)
17. Laraia, R.: *Cultura, um conceito antropológico*, 14th edn. J.Z.E., Rio de Janeiro (2001)
18. Hall, S.: *A identidade cultural na pós-modernidade*, 8th edn. DP&A, Rio de Janeiro (2003)

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