SYSTEMIC MAPPING TO REVITALIZING LOCAL KNOWLEDGE IN AUTOCHTHONOUS COMMUNITIES

- a construction through collaborative design

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Abstract
The Brazilian cultural diversity is broad. Despite the production of a large number of scientific papers, the types of indigenous expressions recorded in the National Institute of Historical and Artistic Heritage are insufficient to cover the variety of ethnicities in Brazil. Therefore, local and indigenous knowledge are in constant risk of loss, degradation or misappropriation. This study describes the elaboration of a systemic mapping that allowed questioning and understanding the process of local knowledge revitalization, taking into account the particular characteristics of the communities. It presents, too, the development process of the mapping through collaborative design together with a group of indigenous teachers and artisans of the Apucaraninha Indigenous community, located in the State of Paraná, South of Brazil. The development process involved the researchers and both indigenous and non-indigenous students. Research methods applied were: theoretical foundation (systematic and bibliographic research); field research (participant observation, workshops, field diary, interviews, graphic and visual recordings); and systemic approach (systemic mapping in order to learn from the participants about cultural valorization and preservation). Ultimately, this paper results in an infographic piece, which is presented along with all its development steps: the systemic mapping with various types of knowledge, the interdisciplinary aspects, the research subject, the process steps for local knowledge management, and the intervention proposals. The involvement of design students led to innovative actions of the social and participatory design, thus having a huge impact on the results.

Introduction: culture, indigenous peoples and delimitation of study
Systemic thinking is discussed in terms of connectedness, relationships and context, considering that the environment and properties of the parts must be understood from the organization of the whole.
Thus, there are divergences to the analytical thinking that isolates the parts in order to understand them, without considering that they are inserted in the same environment (CAPRA, 2006:40-47).

There is a demand for the development of a systemic mapping (infographic) to allow the questioning, the understanding, and the future replication of local knowledge revitalization systems (in this case, applied in an Indigenous community in the State of Paraná, South of Brazil), with the purpose to promote the sustainability of the culture. In order to do so, the management process of local knowledge must be visually organized.

All over the world, indigenous peoples transfer knowledge through generations in a social dynamic of exchanging. They have resisted forms of biotic, ecological, economic and cultural coercion (RIBEIRO, D. 2010). This resistance leads them to a social exclusion that affects their symbolic systems and their sustainability. In the Brazilian territory before colonization, more than 1,000 languages and dialects were spoken by indigenous peoples (ISA, 2017). In comparison with the past, today there are nearly 305 ethnicities with at about 800,000 native inhabitants (IBGE, 1991/2010). Figure 1 shows the cartography data of Brazil’s indigenous lands, including 706 indigenous communities. It represents 13% of the Brazilian territory (ISA, 2017).

Figure 1 – Cartography data of Brazil’s indigenous lands.

Indigenous peoples in Brazil have a rich cultural heritage. Preservation actions should be a priority in the country – there are thirty (30) cultural goods in Brazil, according to the National Institute of Historical and Artistic Heritage (IPHAN, 2017), but only three (03) forms of indigenous expression of plastic manifestation, belonging to only two (02) ethnicities, both localized in the North of Brazil.
Cultural Diversity is an important element for the economy and the society – traditional peoples promote sustainability and have so much knowledge to share with the Western world (UNESCO, 2002, p.3).

Stuart Hall states that modern nations are all cultural hybrids (1997, p. 62). This reminds us that not only modern nations, but also ancestors with the history of interethnic relations have been producing intellectual manifestations, such as the various forms of human expression, representation and communication.

Silva (2013, pp. 96-97) proposes, in his study on translation strategies from the cultural point-of-view, the following definition of culture:

[It is a] set of knowledge and values accumulated and shared among the members of a society, who interpret the world from symbols and signs created in it. Dynamically, it negotiates differences and creates identities. As no culture is free from the influence of external cultures, these identities are created and remodelled from the confrontation between self and others.

According to UNESCO, Local Knowledge should be promoted and protected, because it is the cultural diversity of the world and the basis for sustainability. The organization also says Indigenous Knowledge is tacit and very complex to explain, being at the same time collective and individual. In the collaborative process, the “indigenous” is considered a producer of local, collective, traditional and contemporary knowledge and is part of a dynamic social and cultural process.

The objective of this study is to present a part of the research that has been developed in an indigenous community in the South of Brazil. The ethnicity of this community is called Kaingang, with an estimated population of around 30 thousand native inhabitants (ISA, 2017).

Brazil is a country of a multi-ethnic society. People from the national territory "lived, for a long time, a series of great difficulties in the structuring of the Brazilian society, since the time of discovery" (MOTA; ASSIS, 2008, p.68). Only after the Brazil's 1988 Constitution did they advance in their rights, although access to these rights remained (and continues to be) extremely difficult, according to Mota and Assis (2008, p.68).

**Figure 2 indicates the localization of Apucaraninha Indigenous land.**

![Figure 2 – Localization of Apucaraninha Indigenous Land. Based on: http://www.observatoriodasmetropoles.ufrj.br/metrodata/ibrm/ibrm_londrina.htm](http://www.observatoriodasmetropoles.ufrj.br/metrodata/ibrm/ibrm_londrina.htm)
The systemic mapping elaboration

Systemic design was the approach used to organize the complex elaboration of the systemic mapping. The present research relies on the concepts of “Design for Cultural Sustainability”, which aims to investigate the contribution of design in the development of solutions to the revitalization of indigenous communities (social groups that generate local knowledge). This study prioritizes the graphic and visual forms of intellectual manifestations, even though we acknowledge that there are many other social and cultural demands. The research objective is, together with members of the community, to visually organize the Local Knowledge management process. In order to do so, three research methods (CAVALCANTE, 2014: 137-231) were applied. The first is the theoretical foundation – including systematic and bibliographic research. The second is field research – including participant observation, workshops, field diary, interviews, and graphic and visual recordings. The production process of braided basketry in the Indigenous Land of Apucaraninha was closely observed and investigated over the years. Figure 3 synthesizes the mapping of production and commercialization process of braided basketry. Finally, the last method is the systemic approach (which resulted in the development of the systemic mapping, together with members of the community, in order to understand about cultural valorization and preservation).


¹ Bambusa bambos (L.) Voss [as Bambusa orientalis Nees] Camus, E.G., Les bambusées, Atlas, vol. 2: t. 75, fig. B (1913). Available at:
The definition of this system begins in the classification, organization and definition of the interactivity in hybrid language (verbal and non-verbal). In the infographic, the information about the process of knowledge management was visually organized.

The interaction and verification of the results with the subjects involved were carried out constantly throughout the work as part of an ongoing process of awareness and clarification. The systemic mapping – or infographic – (Figure 4) characterizes the graphical synthesis of development of a model structure for the proposed system, based on anthropological knowledge and design strategies and activities.

The infographic combines written texts and various images, as a hybrid information system for multimedia communication, through different means of languages. It is designed as a mediator system with multiple images (both graphic and photographic), geometric schemes and also written words and numbers. Thus, it integrates, in the same message, verbal and non-verbal languages to reinforce certain meanings. The “redundancy” of information presented in different languages potentially amplifies the effectiveness of the informative-communicative process.

According to Rajamanickam (2005), maps, diagrams, graphs and infographics are usually perceived as visual systems that facilitate the understanding of a message, especially because they reduce the cognitive load required by the observer in understanding the descriptive structure of complex information.

Figure 4 summarizes the results collected during the research. It represents a general structure of the resources for the construction of the local knowledge revitalization system, with emphasis on graphic and visual representation, in order to contribute to the cultural sustainability of indigenous communities of practice.
The design of infographics demands the definition of the following sources, listed in the frame below:

<table>
<thead>
<tr>
<th>PROCESS STEPS</th>
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<tr>
<td><strong>1 KNOWLEDGE TYPE DEFINITION (INPUT)</strong></td>
<td>The system must be designed according to the type of knowledge to be revitalized. In the autochthonous context, this knowledge is in traditions, beliefs, mythologies, cosmologies and abilities.</td>
</tr>
<tr>
<td><strong>2 INTERDISCIPLINARITY</strong></td>
<td>Between Knowledge Management, Anthropology and Design resources.</td>
</tr>
<tr>
<td><strong>3 RESEARCH SUBJECT</strong></td>
<td>The visual language is noted in the semantic structures that can be documented as graphics, because they are embodied or expressed in the artifacts. Similar to all semantic structures (CAPRA, 2006:94), the graphic arts participate in socio-cultural networks of communication. Social systems dynamically involve the consciousness of human beings.</td>
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</table>

Figure 4 – Systemic mapping to revitalizing local knowledge. Adapted from Cavalcante (2014, page 245).
4 PROCESS STEPS OF THE LOCAL KNOWLEDGE MANAGEMENT

(1st) “Initial sensitization” – Previous exploratory research, lectures, workshops, interactions and dialogues aim to consolidate the project objectives together with participants and members of the community;

(2nd) “Local Knowledge identification” – Use of different sources of information. Dialogue, interactions and bibliographic studies;

(3rd) “Capture” – Images of the expressions of knowledge through photographs and manual drawings;

(4th) “Cataloguing” – Coding and establishing hierarchy of samples. Verification of similarities and differences in the graphic-visual patterns of culture, besides signs, that are also symbols with different meanings in the cultural hierarchy;

(5th) “Dissemination” e (6th) “Information Sharing” – The process depends on the involvement of participants for the promotion and continuous learning;

(7th) “Creation of new knowledge” – Valorization and preservation of local knowledge and promotion of cultural protection (UNESCO, 2003).

5 INTERVENTION PROPOSALS (OUTPUT)

Design for Cultural Sustainability – Balance between innovation and respect for tradition (SACHS 2009; FAILING et al. 2007). Structures that generate creativity and motivation for the multipliers (dissemination agents). Preservation of cultural diversity; Proposals of collaboration through design.

Through the systemic approach, the proposed actions and criteria were verified in relation to:

- the balance between innovation and respect for tradition. As indicated by Sacks (2009), this is a criterion to be always observed with regard to the communities that generate local knowledge. According to Failing et al. (2007), it translates a variety of perceptions and beliefs that do not originate from scientific conventionality and therefore require respect in order to provide continuity alongside contemporary projects involving innovation;

- schools. In any community, these are the places of cultural production and knowledge construction. It is also necessary to motivate the multipliers in function of the preservation and cultural valorization and the local knowledge;

- the dissemination of the value of the preservation and revitalization of local culture in the external society. At this point, graphic design can effectively collaborate with the creation of visual and graphic pieces that promote the visualization, understanding and dissemination of the culture that builds local knowledge, as well as the community that generates it;

- cultural revaluation and local products;

- respect and preservation of cultural diversity;

- stimulate the sustainability of cultural diversity. According to Janssens et al. (2010, p.16) the globalization characterized by socioeconomic inequality and socio-cultural diversity puts socio-cultural sustainability under pressure because it is defined as an effective link between several actors in a system;
- the understanding and insight of the concept of social innovation. This term refers to changes in which individuals act to solve everyday problems or create new opportunities. These actions are related to behavioral changes, to the reinforcement of the social fabric and to the practices of more sustainable ideas that generate social well-being (MANZINI, 2008);

- the proposal of registration and composition of cultural collections for the memory and representation of local knowledge. In this sense, design can contribute to the creation of visual and tactile products to favor preservation, such as: graphic design of printed or digital catalogs, promotional graphic pieces and didactic support; interior design for scenarios projects and cultural environments for the organization of collections of material culture, among others;

- the ability of communities to have autonomy for a more endogenous project, i.e. that they are not attached to the traditional copies of foreign models (SACKS, 2009). This requires greater encouragement of educational and cultural processes for community members who need to balance their inner subsistence needs and the preservation of cultural values and environmental riches; and

- recognition of equal dignity (UNESCO, 2001, 2002, 2014). This last topic of actions and proposed criteria has deep relation with respect to cultural diversity, alterity and cultural belonging.

The infographic (Figure 4) is a dynamic system in a constant process of feedback between data, resources and stages of the KM (Knowledge Management) process. Such steps may change, for example, according to the context or design of the research on revitalization of local knowledge.

It should be noted that the knowledge management dialog box helps contextualize the reality studied, especially regarding the concept of Community of Practice (WENGER, 2006; 2012) available at the EGC Knowledge Management framework (NERI; VARVAKIS, 2011) and at Nonaka and Takeuchi’s Knowledge and Modes of Knowledge Conversion (1997). In the Knowledge Media dialog box, the processes of capture, storage, selection, systematization, production, retrieval and knowledge distribution – described by Perassi and Meneghel (2011) – were used.

Therefore, the structuring of resources was organized in a process of knowledge conversion through (1) the handling and perception of Knowledge Management, Media, Design, Cultural Sustainability and Local Knowledge concepts, (2) sketches and studies on visual representation and (3) data synthesis and experiments for the construction and future operation of the system. This was structured in order to allow a greater perception of the dynamics involved in the process of local knowledge revitalization (Figure 4).

The infographic demonstrates the proposed system including basic concepts applied to the preservation, valorization and revitalization of local knowledge. In this study, the cataloging, dissemination, sharing, preservation and cultural valorization of local knowledge are proposed. The material culture is the basis of protection and promotion of the immaterial culture. Knowledge management contributes to contextualizing the studied reality.

The intention is to offer guidance for the collective interest of stimulating, developing and regenerating local knowledge, which is both patrimony of an autochthonous community and heritage of the whole society. Thus, it is also expected to mitigate the threat of extinction and the serious deterioration of cultural manifestations – as well as the misappropriation – of local and traditional knowledge.
The “Design for Cultural Sustainability” can be defined as a set of propositions and actions that, with a focus on sociocultural innovation, allows the search for co-design solutions in a participatory context of design, production and consumption, favoring social cohesion and promoting sustainable lifestyles. Therefore, this research briefly presented its practical and theoretical results within a systemic approach to structural resources for the construction of a local knowledge revitalization system, which can be replicated in other scenarios – specifically those requiring the sustainability of cultural manifestations of local, traditional and/or indigenous communities.

**Conclusion**

In the indigenous context it is necessary to be willing to assimilate the subjectivity and the intersubjectivity of the individuals in the community. It is necessary to prioritize the symbolic forms through which indigenous peoples are founded by means of constant dialogue and learning, verification of interethnic relations, and alterity of the group being accompanied. Besides understanding that indigenous societies in Brazil have lived in physical and cultural resistance for centuries, the designer, whose performance within these groups is complex, must learn to perform their actions in the time and space of these communities. More complex is the confrontation of the problems caused by globalization, since such a world phenomenon of uniformization disrespects the cultural and environmental diversity, hindering the fair trade, the solidarity and the sustainability of these peoples.

Previous research has resulted in the development of new academic projects and engaged student from the Fashion and Graphic Design courses of State University of Londrina. The integration between indigenous and non-indigenous students has built and disseminated mutual knowledge among the participating groups and has increasingly demonstrated the need to value the peoples and their indigenous knowledge.

Constant learning is of vital importance to understand that diversity is what builds our humanity.

**References**


