

## **Community memory as a process: reflections and indications for design**

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### **Abstract**

*This paper is dedicated to memory as a social process: social, because it focuses on communities; process, because it focuses on the role that memory plays in social practice. Its aim is twofold: on the one hand, it wants to contribute on our understanding of communities and their memory; on the other it outlines some indications for the design of systems supporting community memory. Both analytical reflections and design indications are based on the experiences of the author within several projects, where he collaborated with several people from different countries.*

### **1. Foreword**

In this paper I will focus my attention on memory as a social process, disregarding both the biological and psychological characterization of individual memories and the links connecting individual memories to social behavior. In order to help the reader to open her mind to my discourse, I begin it with two short stories where memory as a process emerges as a relevant theme.

### **The old woman in the Ghetto of Venezia**

When we began the Campiello project<sup>1</sup>, in Autumn 1997, the whole project team visited Venezia for two days to become familiar with the city where we had to develop our experiments. Wandering in the city, we arrived to the Ghetto, the neighborhood the city reserved for Jews. It is a very peculiar part of the city, since it is very old and its buildings were built in accordance with the strict rules the government of Venezia imposed to the Jews. While we were in the Campo del Ghetto Nuovo (New Ghetto Square) trying to recognize the old Synagogues among the windows of the many tall buildings surrounding it, an old lady, sitting in one of the benches of the square, came close to us asking if she could help us. And she indicated us the Spanish, German and 'Canton' Synagogues, adding that they were no more used for the everyday occasions from the end of eighteenth century, when Napoleon canceled any religious discrimination, allowing Jews to open a Synagogue at the street level. A new Synagogue was erected out of the Square, which is still in use. The old ones are today used only in special occasions (funerals, weddings ...), but for one, the Spanish one, that is difficult to reach due to a difficult stair.

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<sup>1</sup> Campiello, was a long term research project funded by the European Community in the i3 (intelligent information interfaces) domain - 'connected community' scheme. Campiello aimed to design and experiment an interactive participatory medium diffused in the territory building a dynamic shared knowledge to support the exchange of information and experiences between the local community and visitors. It lasted for three years, from mid 1996 to mid 2000. The consortium developing Campiello was composed by the following partners: DISCo, University of Milano - Bicocca, Milano, Italy; Municipality of Chania, Crete, Greece; Domus Academy, Milano, Italy; FORTHnet A.E., Hellenic Telecommunications & Telematics Applications Company, Crete, Greece; Xerox Research Centre Europe - Grenoble, Laboratory, Grenoble, France; and Technical University of Crete/Lab. Of Distributed Multimedia Information Systems, Crete. For details about the project outcomes: (Agostini et al., 2000, 2003).

The old woman in the Ghetto offered us, who were beginning a project aiming to revitalize the communities living in art cities, a very unique example of what we were looking for: helping those communities to share knowledge about their place, its history, its inhabitants, its costume, etc., so that they could become again its owners, offering to visitors a warm hospitality.



*Fig. 1 - Venezia, Campo del Ghetto (Ghetto Square)*

The lady acted as a member of her community, opening it to the visitors, warmly hosting them in its territory, in its place. The knowledge she exhibited was, in the same time, the memory of her community, she shared with other members, regarding its place, their practice and their common history, characterizing her identity as a member of the community, and means through which other people can approach the community, access its knowledge and become familiar with its territory and its members. Community memory is continuously renovating itself, since it connects past and present, reshaping its place in accordance with current practice of its members.

### **Visiting the site of an accident**

At April 18th 2002, in the late afternoon a small plane crashed against the Pirelli tower, site of the Regional Government of Lombardy and one of the most popular symbols of Milano, causing the death of two women and of the pilot. People's emotion was very great, since the memory of everyone went back to September 11th of the previous year when the Twin Towers crashed down in New York for the terrorist attack of Al Qaeda. Even if, in short it was possible to exclude that it was a terrorist attack, the emotion did not decline. I had in those days a privileged observation point since I live very close to the Pirelli tower (there has been a short period when it seemed that my family had to evacuate) and thousands of people passed under my windows to go to see the disaster. In fact, the area around the Pirelli tower was immediately closed to the public, and the street where is situated my apartment was the closest path to reach the position from which the effect of the impact of the plane into it was clearly visible. It was for these reasons that from my windows I could see the uninterrupted procession of people coming to see it.



*Fig. 2 - The Pirelli tower after the accident*

The number of people coming to see the effects of the accident was greater in the evening (and even in night hours) and visitors, generally, were silent when coming and more noisy when leaving, since they were commenting what they had seen. It was not a new phenomenon: when Lady Diana died, when the Twin Towers were attacked, people exhibited the same curiosity and will to have the most direct and close experience as possible of the event. The fact that I could observe directly the behavior of the people visiting the Pirelli tower, increased my attention to the phenomenon, and connecting it to what I could observe and listen in the days after, when people who visited the site commented the accident, saying: "I have been there yesterday night and I think ...", I found a non superficial explanation of the incredible curiosity people had for the

accident site. Coming to see in persona the effects of the accident was a way for not remaining a passive spectator of the event but becoming one of its actors: saying "I have been there yesterday night ..." a person shifts the attention from the event of the plane crashing against the Pirelli tower to the visit he did at the place of the accident, embedding the accident within her own stories of action and inter-action. What a person communicates to other people must be something she lived directly that she wants to share with them. Our memory, therefore, combines our direct experiences with the stories we heard by other members of the communities whose we are members of, reducing to any of the above categories all the occasions where we were passive spectators of the media, sometimes by means of surprisingly ingenious behavior.

The two above stories, even if very different, are good examples of how sharing the memory of past events constitutes the texture of our social relationships. On the one hand, in fact, the old woman hosts and welcomes the visitors in the Ghetto sharing with them the memory of the Hebrew community living there; on the other, the people going to view the Pirelli tower after the accident are creating personal memories of it that they can share with other people contributing to their common history.

It is therefore interesting to investigate memory, disregarding its biological and psychological characterization, to deepen our understanding of the social dimension of human lives. In this paper we will focus on the memory of communities showing its dynamical dimension, to learn something about the type of support we can design to enhance their vitality and effectiveness.

The next session briefly recalls the fundamental features of communities and of their memories, while section 3 proposes some hints on the design systems supporting communities and their memories. Section 4 pays attention to one major issue in community systems, namely their ontology. Section 5 concludes the paper resuming its major points and proposing some open problems.

## **2. The memory of a community**

"Communities are social entities whose actors share common needs, interests, or practices: they constitute the basic units of social experience." (Huysman et al., 2003; p.xi). From a complementary viewpoint, looking at its phenomenological features, a community is an aggregate of inter-acting people sharing an experience, a place, a language, a memory. Even if we can distinguish different types of communities, characterized respectively by their place (local communities), their experience (communities of practice and/or of interest; see: Lave, Wenger, 1991; Wenger 1998), their language (for example, Italian communities abroad), their memory (religious communities), every community is defined in the whole four-dimensional space introduced above. Moreover, experience, place, language and memory of a community constitute an inextricable bundle.

The members of a community share their experiences either living them together or, more often, conversing about them (see the "visiting the site of an accident" story above). Within their conversations, the members of a community share a language or,

more precisely, a language game (Wittgenstein, 1963), defining their potential for future actions and inter-actions as well as reflecting their experiences. The language shared by the members of a community transforms the portion of space where they live into a place, investing it "with understandings of behavioral appropriateness, cultural expectations, and so forth" (Harrison, Dourish, 1996).

In other words, a place is a portion of space decorated with sense. The members of a community share an experience, a language and place because they share a memory of the past as well as of the future (see: Brandimonte, 2004). Community memory in its evolution links, in fact, past experiences to the new experiences within which the latter are recalled and shared, helping to transform the remembrance of a past experience into a new experience. Memory constitutes the cognitive counterpart of the place of a community: Every community has therefore an inner as well as an outer identity. On the one hand, the place of a community has boundaries delimiting it and separating members and non-members; on the other, its memory becomes the ground on which members build their individual and collective identity, distinguishing them with respect to other people.

The boundary delimiting a community is generated, in the same moment, by the greater potential for action and inter-action of its members in its place and by the physical and institutional filters non-members have to pass in order to participate in it. It has to be noted also, that the boundary is not only delimiting but also opening the community to newcomers: boundaries can be surpassed, memories can be shared.

In the last years the attention of various disciplines has gone back to the concept of community, both to underline the crisis of social experience and to suggest the potential for socialization human beings can still access. The French philosopher Jean Luc Nancy (1990) has interpreted the concept of 'da-sein (being there)' of Martin Heidegger (1927) as 'mit-sein (being with)' claiming that our life experience is essentially social and that the place of this experience is the community. Even without adhering to the radical view of Nancy, for whom the personal identity of human beings emerges from the 'mit-sein' within communities, the Californian school of work ethnography has defined the concept of 'community of practice' to characterize the communitarian dimension of any work-practice (Lave, Wenger, 1991; Wenger, 1998; Brown, Duguid, 2000). It is something more than recognizing that human work is frequently performed in teams: communities of practice constitute the social context where we live our working experiences and we build our competence in performing them. Communities, in fact, are the place where people learn to practice in a process moving from a peripheral to a central participation (Lave & Wenger, 1991).

Even from this very short and schematic resume of the concept of community, it should appear clear that memory plays a central role in it, linking together its language, space and experience. On the memory they share, the members of a community ground their common membership, coupling their common identity with their common potential for action and inter-action. Community memory is not static reflection of the past experiences, not only because it is

both memory of the past and of the future, but also because it is continuously changing through the conversations of its members. As it is pointed out by the case of the people visiting the Pirelli Tower after the accident, within a community recalling and sharing an experience, is itself an experience. Narrations allow members who did not participate in an experience to share its memory with those who participated in it. Narrations allow also crossing the boundaries of a community, since, listening to them, its members can open themselves to the experiences of other people, of other communities and conversely, through them, they can share their experiences with other (recall the old woman of the Ghetto of Venezia, above). Community memory is intrinsically narrative.

It emerges from what I have written above that memory is relevant for communities as a process through which members share the knowledge of past experiences, transform the space where they live in their place and co-create the language (game) through which they can inter-act and give sense to their actions. Memory is not a collection of information about the past and future events of the community: rather it is the process through which that collection is continuously re-created. Making reference to Nonaka and Takeuchi (1995), memory is the process through which a community continuously creates its knowledge or, in other words, through which it capitalizes social value.

The crisis of communities in the contemporary society is twofold: on the one hand, there is no more a criterion ordering the multiplicity of communities where people live their social experiences and human beings seem unable to deal with the diversities it creates; on the other, globalization is reducing the space for communities, weakening their identities and the ties binding their members (Putnam, 2000). Moreover, in many parts of the world communities react to their decline closing aggressively themselves and considering non-members as enemies. The concern for communities many observers share today is, therefore, in the same time fair for what communities can do against social order (as many dramatic cases all around the world testify) and for the impoverishment of social life their decline can provoke (as everyone can see all over the western world).

From a community memory viewpoint, the two above remarks point to two different aspects of the decline of a community: on the one hand, its memory becomes always more closed with respect to the outer world, so that its knowledge impoverishes; on the other, it becomes always more unable to retain the experiences of its members, so that there is no way to capitalize the knowledge created within them.

### **3. Supporting the memory of a community**

It is evident that the decline of communities is mainly a political question, requiring choices to be taken at the supranational and national levels. This paper is not the right place and I am not the right person to discuss this issue. But we can observe that, even when these political choices are taken, it may be very difficult to make them effective, because the decline and/or closure of communities develops as a spontaneous process determined by the concrete conditions of social life today. Human mobility (both spatial and social), mass

communication, international networks, specialized services, national and supra-national institutions seem all converge towards voiding the place of communities, weakening their social ties, destroying their roots, homologating their language.

It seems that below the surface of different intentions and plans, the growing complexity of our life makes always more difficult the survival of communities. As it was pointed out also by Robert Putnam in his invited talk at CSCW 2002 in Philadelphia, ending with a call to the researchers and practitioners of CSCW (Computer Supported Cooperative Work) for dedicating their intelligence and their efforts towards the development of systems helping declining communities to revitalize, information and communication technology can play a relevant role in this respect.

We strongly agree with this claim, but we must underline that technology 'per se' can not help communities to revitalize; on the contrary, information and communication technology is also a relevant means through which globalisation induces them to decline. We need, therefore, to understand the requirements that a computer-based system must satisfy for being a community support system. This understanding can only emerge from careful observation of human practice and evaluation of the systems communities may adopt.

In this section we shortly discuss, from the community memory viewpoint, some requirements we have discovered within our projects and the systems we have developed to meet them.

*A) Supporting community memory requires supporting, on one side, access and navigation, on the other, renovation and transformation.*

In most systems devoted to knowledge management and/or to the support of organizational memory, as well as in many systems supporting communities, there is a clear-cut separation from the content access and creation features, while the former are designed for generic users with great attention to user friendliness the latter are for professional editorial roles. Systems of this type are electronic publishing systems but can do little for supporting a community memory, in particular with respect to updating the memory of the experiences of its members.

A true community memory supporting system is not only a knowledge-based system making its content easily accessible, rather it is a system supporting memory as a process: from its enrichment (through creation of new knowledge), to its storage (with efficient search mechanisms), from its presentation (in such a way that users get it immediately) to its diffusion (in a point-to-point or broadcasting way). The system must support the whole knowledge circulation process, not only its final stage, as it is shown in the diagram of Figure 3, presenting the model implemented in the Campiello system (see footnote in the first page of this text).

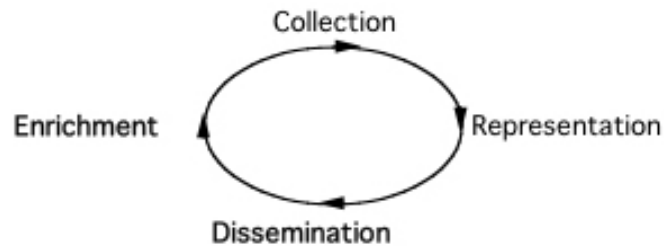


Figure 3 – The process around community memories (Campiello)

B) Supporting community memory requires supporting users whoever, wherever and whenever they are.

Community and/or civic networks have emerged in the nineties as an important component of the perspective looking for applications of the information and communication technology able to enhance socialization (Casapulla et al., 1995; Schuler, 1996; Ishida, 1998; Ishida, Isbister, 2000).



Figure 4 – The Community Wall (Campiello)

Despite their numerous merits, community networks do not go beyond the narrow focus of offering access through PC's access to information and communication services. For this reason, they risk , on the one hand, to confuse the community of their users with the community they make reference to, on the other, to create a gap between those users who like to play with the technology and those who don't like. It is not only the well-known question of Digital Divide (Warschauer, 2003): rather it is a more general problem. Community memory is pervasively present in any situation of social life: any system supporting it must deliver its services to members whoever, wherever and whenever they are.



This means that systems supporting community memory should be multi-channel and that each channel should provide specific interaction means with the system, based on its features and on the situation of its users. The Campiello system (Agostini et al., 2002) is accessible through PC's, large interactive screens located in public places (Community Walls; see Figure 4) and coded paper (Interactive Fliers). The Milk system<sup>2</sup> is accessible through PC's, large interactive screens located in meeting rooms and in social spaces and cellular phones. Building multi-channel systems as the two mentioned above, requires to rethink their architecture, with a clear-cut separation between the knowledge management system, characterized by several services (searching, indexing, profiling, etc.), and the interaction managers for each channel, selectively making use of them (see, for example, the architecture of the Milk system in Figure 5 and in: Agostini et al., 2003).

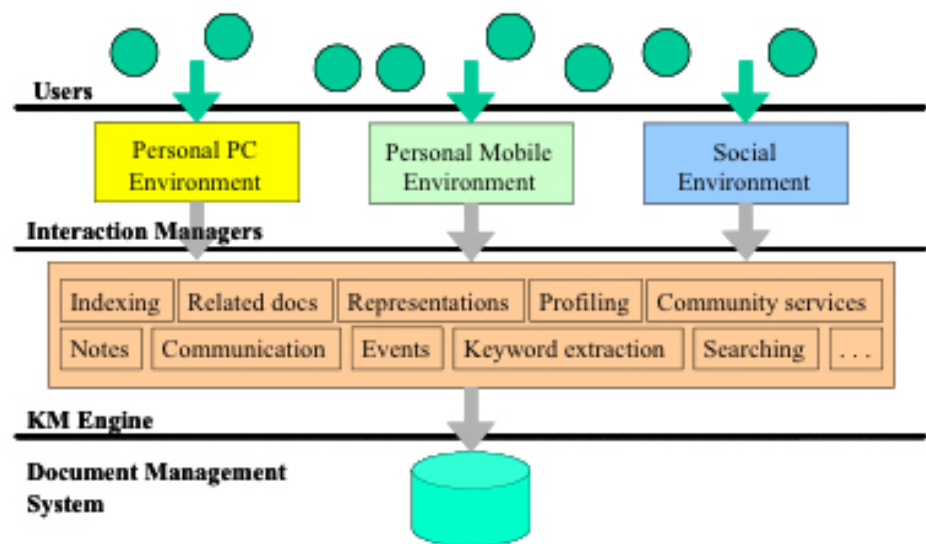


Figure 5 - The architecture of the Milk system

*C. Supporting community memory requires presenting records of past experiences so that the actions and interactions of members become more effective.*

The possibility to search in the knowledge base internal and/or external knowledge is surely an important service of any knowledge management system and, therefore, for any system supporting community memory. But, in general, people are not willing to search something: they are doing something and they need accessing related knowledge while performing their practice: searching is due to the

<sup>2</sup> Milk, was a long term research project funded by the European Community in the IST Section of the VI Framework Program. Milk aimed to design and experiment a knowledge management system supporting communities of practice within innovative companies employing knowledge workers. It lasted for two years and a half, from January 2002 to mid 2004. The consortium developing Milk was composed by the following partners: Butera e Partners, Milano, Italy; DISCo, University of Milano - Bicocca, Milano, Italy; Domus Academy, Milano, Italy; Fraunhofer FIT, Bonn, Germany; IRSO, Milano, Italy; Orbiteam Software, Bonn, Germany; PictureSafe, Hannover, Germany; Xerox Professional Services, Xerox Research Centre Europe - Grenoble, Laboratory, Grenoble, France. For details about the project outcomes: (Agostini et al., 2003).

fact that they miss something. This is especially relevant when people are interacting in groups and there is no time for suspending what they are doing for doing a search in the knowledge base.

What they really need, it is that the system presents them, together with the object they are working on, all the related knowledge: on the one side, all the related documents and/or objects (explicit knowledge), on the other, the links to the people who have competence on it (tacit knowledge); on the one side, all the documents, messages and people related to the object (internal knowledge), on the other all the documents, objects and people semantically related to it (external knowledge).

In Milk, we have created at this purpose the "view with context" interaction mechanism, situating any document users are opening in a visual context where related objects and people are orderly presented and made accessible (Figure 6 and Agostini et al., 2003).

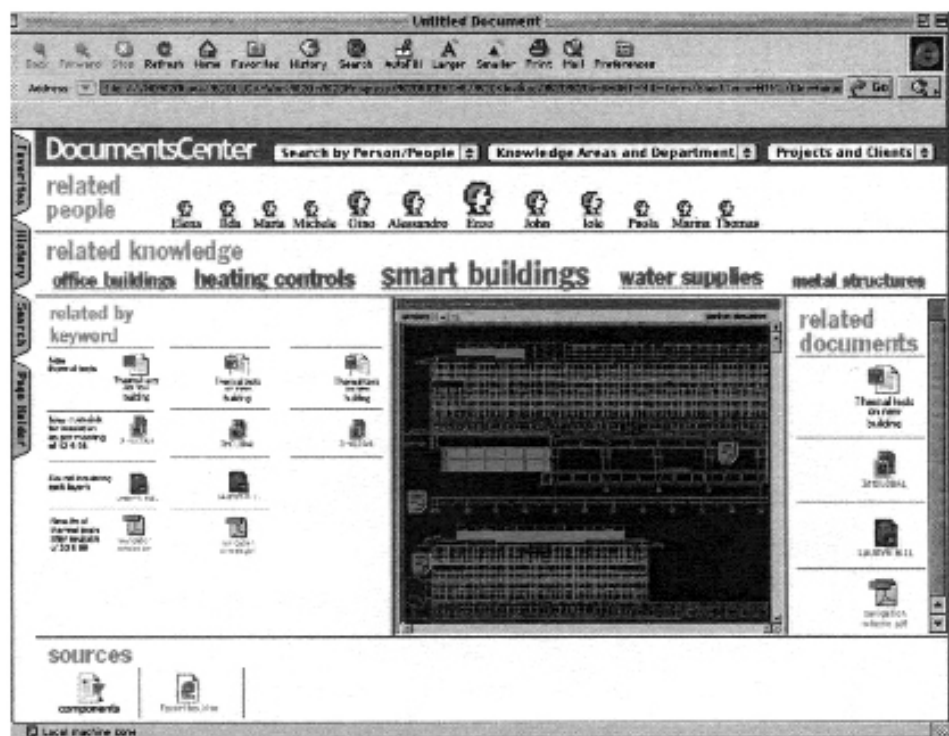


Figure 6 – The view with context (Milk)

#### *D. Supporting community memory should avoid creating distinctions between content creators and consumers.*

The discussion about the requirement above, points out an important aspect of the practice of communities. The access to knowledge is, generally, not making sense 'per se', where people are purely consumers of information: rather its is part of an activity where new knowledge is created. Nonaka and Takeuchi (1995) describe this situation with the knowledge spiral showing the continuous connecting internalization and externalization of knowledge (Figure 7).

This means that not only both content creation and access are both services to be delivered on-line to users, but also that creation and access are linked each other in an inextricable way, so that users should be able to switch among them without continuity solution. The

working environment we have created in the Atelier project<sup>3</sup> for the



Figure 7 – The knowledge spiral (Nonaka, Takeuchi, 1995)

architecture and interaction design students is a good example of the variety of functions and services that are provided to users for accessing and creating new content. As it can be seen in Figure 8, the place of a project team (in Atelier, a particular attention has been dedicated to the integration of physical and virtual object and spaces into an augmented place; on this issue see also the Conclusion) is full of tools and systems for designing new artifacts and for presenting them (Binder et al., 2004).

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<sup>3</sup> Atelier, was a long term research project funded by the European Community in the Disappearing Computer Initiative. Atelier aimed to design and experiment new inspirational tools diffused in the project spaces within classes of architecture and interaction design, to enhance their creative learning. It lasted for three years, from December 2001 to mid 2004. The consortium developing Atelier was composed by the following partners: [Center for CSCW, Institute for Technology Design and Assessment, Vienna University of Technology, Wien, Austria](#); [Department of Information Processing Science, University of Oulu, Oulu, Finland](#); [DISCo, University of Milano - Bicocca, Milano, Italy](#); [Imagination, Wien, Austria](#); [Interactive Institute: Space & Virtuality Studio, Malmö, Sweden](#); [Institute for Art and Architecture, Academy of Fine Arts in Vienna, Wien, Austria](#); [School of Arts and Communication, Malmö University, Malmö, Sweden](#). For details about the project outcomes: (Binder et al., 2004).

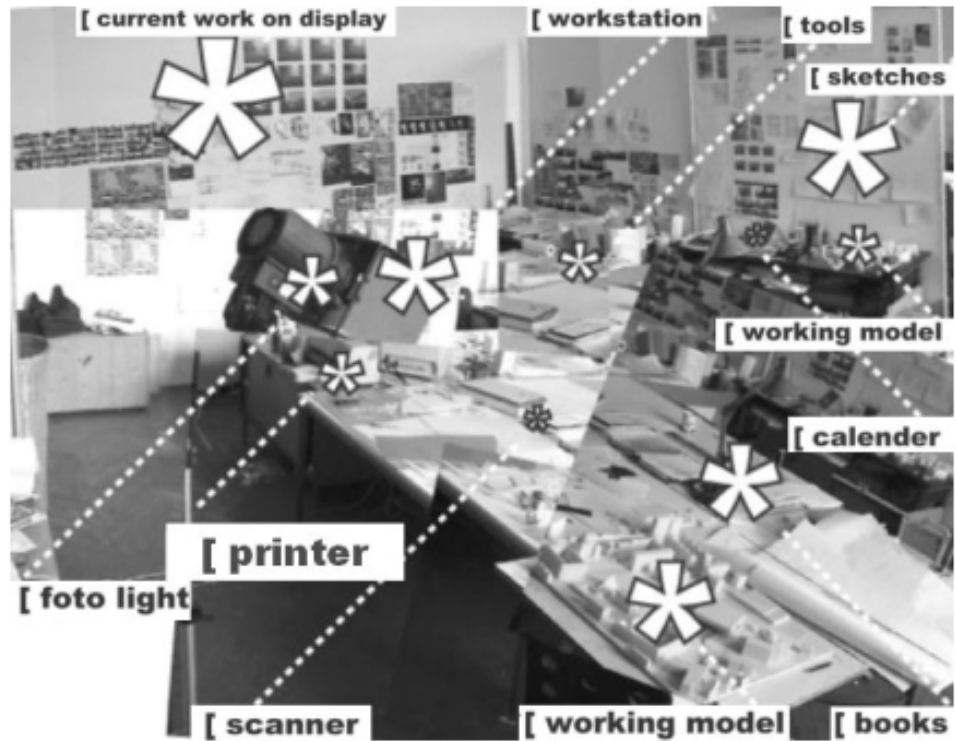


Figure 8 – The student working space (Atelier)

*E. Supporting community memory implies building a knowledge base reflecting its ontology. Any community has its own ontology.*

As it has been underlined above, collecting objects, documents and links to persons is not sufficient for delivering a system supporting a community memory: the system must also be able to search, filter and present the knowledge related to a given object in accordance with both semantic and pragmatic perspectives. While the semantic component of a “view with context” may be based, when the community is characterized by a professional competence, as in the case of communities of practice and/or of interest, on the ontology characterizing a specific discipline (e.g. in the Atelier case, we have developed the ontology of architecture) allowing to integrate external and internal knowledge through the changes users may do on it, its pragmatic component must reflect strictly the experiences of the community. It is not easy to define the ground for the ontology of the practice of a community: on the one side, it is semantically closer to the philosophical definition of ontology than the typical ontologies developed within artificial intelligence and knowledge engineering; on the other, it has to be based on common sense reasoning and some universal properties of human practice. We will discuss in more detail the rationale of the pragmatic ontology we have designed for Atelier, that is derived from a proposal by Edmundo Leiva-Lobos (1995) in the next Section.

#### **4. The ontology of social life**

If we are looking to human practice, it can be good to assume the viewpoint adopted by Ludwig Wittgenstein in his “Tractatus Logico-Philosophicus” (1961), where Proposition 1.1 asserts: “The world is the totality of facts, not of things”. In other words, the ontology we

are looking for is devoted to the characterization of the facts constituting human practice. How can these facts be characterized? First of all, they can be characterized in the spatial-temporal dimension locating them in time and space; second, they can be characterized by the human beings participating in them or, more precisely, by the communities within which they happen.

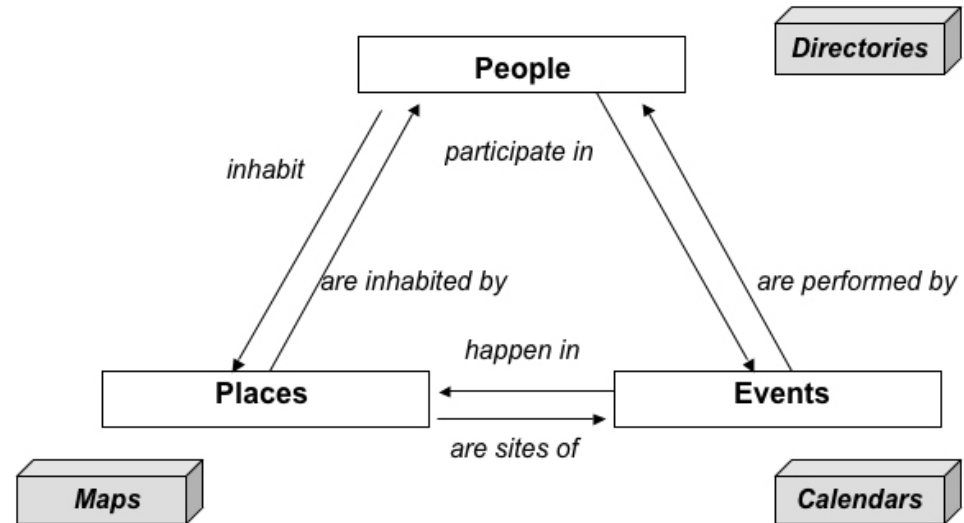


Figure 9 – The 3-ontology (Leiva- Lobos, 1999)

On this basis, Edmundo Leiva-Lobos has developed the 3-Ontology, as a universal basis for the ontology of social practice, and therefore also of the practice of a community, where every fact has three dimensions: its place, its event and its people (Figure 9).

Places, Events and People (more precisely Communities of people) are constituted, respectively, by places, events and people, reflecting the different granularity level of the viewpoint that the observer can adopt.

The three dimensions of a fact are strictly inter-related, since they are recalling each other in order to deepen the characterization of facts. Places are spatial entities characterized in time (what happened and/or happens and/or will happen there) and in people (who lived and/or lives and/or will live there). Events are temporal entities characterized in space (where did and/or does and/or will it happen) and in people (who participated and/or participates and/or will participate in it). People are social entities characterized in space (where did and/or do and /or will do they live) and time (in which events did and/or do and/or will do they participate).

Within the three above categories, the users can define any sub-category and any link among sub-categories: the three basic categories of 3-ontology are the universal basis of the specific ontology of any community. The ontological (in philosophical sense) nature of the place, event and people categories is confirmed by the fact that it is reflected by the fact that they are the basis for three synthetic representation forms that are today standard all over the world. Spatial entities can be represented in maps. Temporal entities can be represented in calendars. Social entities can be represented in

directories. It is not by chance that calendars, maps and directories are the basic external supports for human memory and that the possibility of sharing them makes them especially suitable for supporting the memory of a community (both with respect to its members and newcomers and/or visitors).

## **5. Conclusion**

As I have anticipated in the previous pages, in the Atelier project, where our aim was to design an environment supporting creative learning, we have developed in a more radical and explicit form than in previous projects systems creating augmented spaces, i.e. combining physical and virtual spaces. It is a line of research that was opened by the seminal work of Mark Weiser (1993) and that is gaining interest in different research fields, as it is shown by research programs (e.g. Disappearing Computer in the VI Framework Program of the European Community), conferences (e.g. Ubiquitous Computing) and scientific journals (Pervasive and Ubiquitous Computing) and books (The Invisible Computer; Norman, 1998).

Moving within this perspective helps to get a deeper understanding of the intrinsic connection between the place and the memory of a community: The effectiveness of the latter doesn't depend only on the quality of information it contains but also, and it is not a minor feature, on its spatial distribution and representation: designing systems supporting the memory of a community means designing its place. I have claimed above that the growing complexity of social interactions today is making more difficult the survival of communities: this observation can be declined in spatial terms saying that the physical space is no more able to host the place of a community. The systems we design for supporting their memory must therefore create new augmented places exhibiting properties (openness, multiplicity and continuity; De Michelis, 1998, 2003) physical spaces can't have. In Atelier, for example, students could configure their working space in such a way that it could support dynamic representations linking videos and/or other digitalized information to paper drawings and maps (Figure 10 and Binder et al., 2004).



*Figure 10 – Configurations of sensors, artifacts, digital media and projections*

Another device designed within Atelier has inspired a further conceptualization of the nature of augmented places: the Texture Brush designed by Imagination for covering a physical model with a virtual texture (Figure 11 and Binder et al., 2004), is in fact a good example of the type of objects that should inhabit an augmented place. We have called it a prototypal Mixed Object (De Michelis, 2004; Binder et al., 2004) and we are currently engaged in analyzing their constitutive features and their qualities to provide a basis for future design of systems supporting communities of users.

Considering the latter, and among them systems supporting community memory, as mixed objects gives a solid foundation to the multi-disciplinary approach we are experimenting in our projects from almost ten years (Agostini et al., 2000). In order to design systems being based on information and communication technology, transforming the space where they will be located and, finally, offering new possibilities to the actions and inter-actions of their users requires the collaboration of three different cultures: namely, technology, design and social sciences. Multi-disciplinary design is not an easy task, since the different cultures have no experience in cooperating together, but the experiences we did in Campiello, Milk and Atelier indicate that it can give raise to a new generation of applications of information and communication technology.



Figure 11 - *The Texture Brush*, designed by Imagination (Atelier)

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