

Social Interaction through Map-based Wiki

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Abstract. A map, either geographical or conceptual, can be considered as a common knowledge base for a community of interest: the map is the boundary object through which the community members interact and can produce new knowledge. A digital map becomes the medium that permits knowledge accumulation: in this sense, an interactive map and the tools to interact with it can be considered as a wiki. A primitive operation on this "map-based wiki" is the annotation that can be sharable with the other members of the community of interest and that can be evolved by the members who share it. Annotation on a map can be multimodal. In particular, iconic and sound annotation can determine an emotional mood in the perception of the map space, while textual and graphical annotations set up an information space. Both emotional and informative moods can evolve because annotation is open to the adds and changes performed by the map users in the communication processes. Moreover, the possibility to localize the annotation on a map permits to partially overcome the misunderstanding and limitations in interaction and communication due to the cultural background and ethos.

Keywords: map annotation, social interaction and communication.

1 Introduction

Maps are one of the ancient and useful tools to organize and display knowledge, starting from the primary use as medium for geographic information. For this goal, maps are depictions of areas of the surface of the earth that involve generalization – pictorial representations show only some features considered relevant for a cartographer – and symbolization – some areas are represented by a symbol as a dot for a town [1]. Maps have been used as both storage and display medium for information: reading a map that describes an area can also permit to have additional information such as distances, geographical coordinates, elevation, administrative borders, but also advertising information and so on. Moreover, a map can be used to represent historical data not only as data related to a specific geographic area (the map of a country during a century) but also as historical events spatially represented (i.e., a timeline). Anyway, all of these kinds of information are static: they are represented

once for all and, if information changes, a new map is needed. In the electronic era, maps become dynamic and interactive. They are dynamic in that the visualization is the representation of data from a database: changing data in the database modifies the displaying of the map. Maps are interactive in that different users can work on the displayed map and add, organize in different ways, and/or change information that is displayed. This feature makes the map, on one hand, a common knowledge base for a community of interest, on the other hand, a social medium for people interaction. These characteristics are not independent: the possibility for a knowledge base to be modified is the necessary premise for a social medium. Maps act as common knowledge base because they are the virtual space in which data and information are displayed and people can perceive and manipulate the information. When maps are accessible to other people, and when these maps are available on line, many people can manage the information and, interacting with it, they interact with other users of the map: the map becomes the perceptible part of a social medium, the boundary object through which different users interact [2]. This social aspect is conveyed not only by geographical maps, but also by concept or mind maps. Concept maps are here intended as diagrams showing the relationships among concepts: concepts are connected with labeled arrows, in a downward-branching hierarchical structure. Mind maps are diagrams used to represent words, ideas, tasks or other items linked to and arranged around a central key word or idea: differing from concept maps, mind maps have no formal restriction on the kinds of link used.

In this work, a digital map is considered as a social medium when:

1. it is the display for information stored in a linked knowledge management system;
2. users can access and modify the displayed information;
3. users can share added information;
4. users can act on the information added by other users;
5. the interaction among users and between users and information is allowed through the map.

These features define a *map-based wiki*.

In the following, we analyze some example of social interaction among users aimed at enhancing common knowledge.

2 Social interaction through digital maps

GoogleMaps [3] has dramatically changed the way to use and see a digital map. GIS introduced virtual maps as displays for information located in databases and managed by complex systems: they permit to lead complex operations on the information operating on the map layers. On the other hand, these systems are addressed to communities of geoinformatics experts. GoogleMaps discloses new possibilities for web-users in acting with a map. GoogleMaps permits to work in a simple way when searching places or planning trips. In particular, the functionality “MyMap” allows the user to annotate a map through a text or adding photos and videos and then to share the map with other users s/he selects by sending them the map URL (in this case the map is private). It is a one-way communication because selected users can not interact directly with the creator of the private map: they cannot annotate the same

private map and they can not answer the annotation on the map. Anyway this feature of GoogleMaps has been used for creating a map-based wiki: the WikiMapia project [4]. WikiMapia allows registered users to select interesting places by drawing the borders: then a user can write a text about the place and also add photos. Other users can access the place by clicking on the area located by the borders, see the annotation and also add some comments. As in a usual wiki, it is also possible to edit the annotation referred to the place. Editing and commenting are allowed only to signed users.

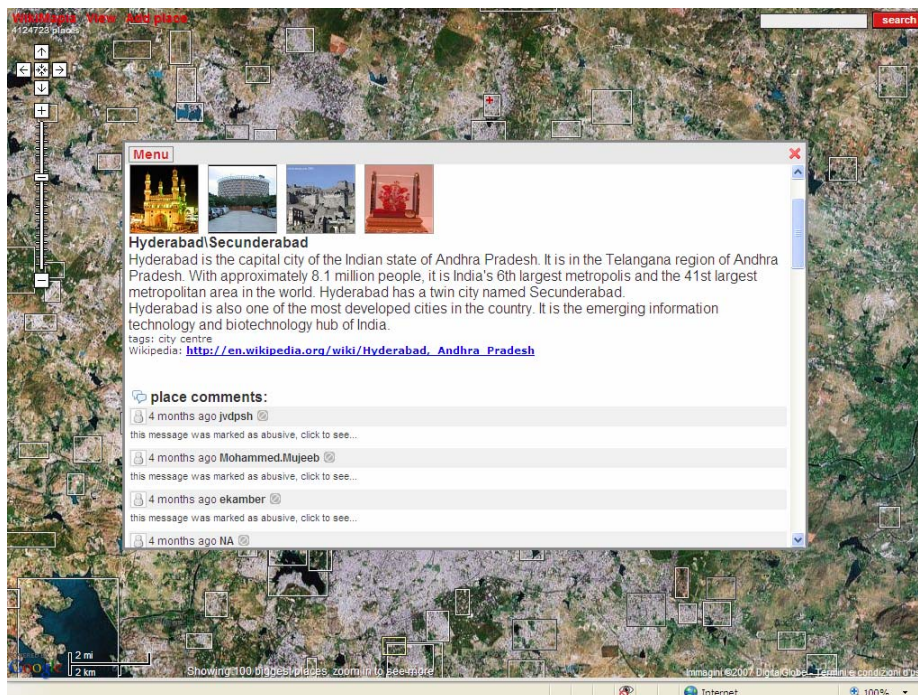


Fig. 1. An annotation on the digital map representing Hyderabad, India, in WikiMapia. In the bottom of the central box, some comments are displayed.

Users groups commenting or editing annotations in WikiMapia seem to be informal group, characterized by common interests, for instance, in a same place at a specific time. Other map-based wikis define the relationships among members of a group of interest or explicitly create a group to annotate places in some special way. An example in the first case is the FOAFnaut, which is not based on a geographical map but on a graph that defines the closeness of the users signed in the FOAFnaut tool, a sort of mind map of people involved in one of the FOAF project [5]. Relationships among people are displayed through arrows linking interactive icons representing people and through pictures showing the two connected persons. The relationships are determined using as property the fact that the two people know each other and, eventually, they are codepicted in a same picture (as in Fig. 2). The annotation box on the screen displays metadata about the photo related to the selected icon (about the

person represented by the icon). Signing in, a member can add some pictures and information about her/himself and build relationships specifying who s/he knows in the network.

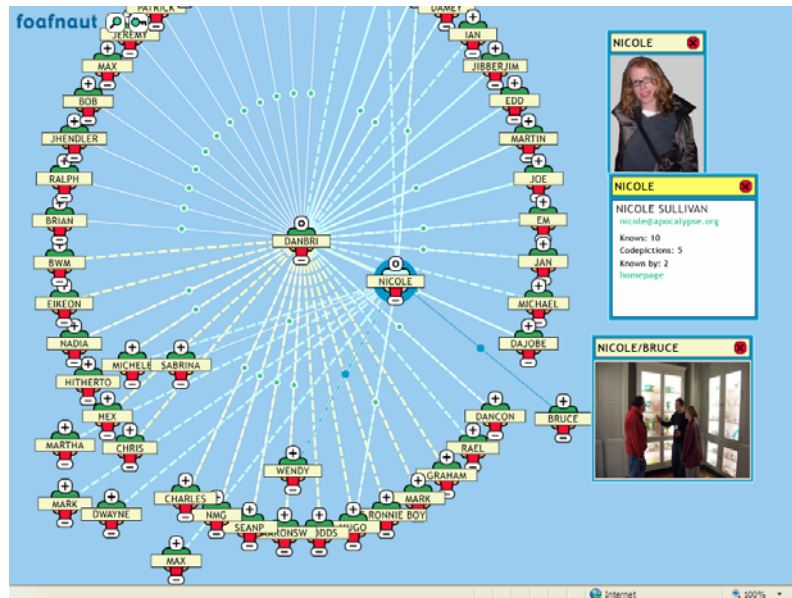


Fig. 2. FOAFnaut shows the relationships among the members: the blue line shows the codepiction of two persons; clicking on the circle on the line a picture showing the related persons (Nicole and Bruce) appears. An annotation box containing information about Nicole is also displayed because Nicole is the starting selected person in the map.

Regardless of the specific use, FOAFnaut experiment is interesting because the displayed mind map is the result of the application of metrics such as centrality, closeness, density and cohesion which are characteristic of social network analysis[6]. A further “flavour” of social network built on maps is represented by the “*Silence of the Lands*” project [2]: “*Silence of the Lands*” is a virtual museum of natural quiet in which sound annotations are the key components. Sound annotations express in a more intimate way than textual annotations the experience of the natural heritage through the sounds directly captured from a natural environment. Sounds represent, indeed, an intimate aspect of visitors’ perceptions and experiences of natural heritage. The technological and social infrastructures supporting the *Silence of the Lands* virtual museum allow members and stakeholders from the local community of Boulder (USA) to collect sounds from a natural environment and automatically associate them through locative media with the precise time and space in order to be visualized on a GIS map. Then they can access their own sound annotations, describe them through several descriptors and composing them together in order to create their own soundscape, as a sound landscape to be preserved on the Web. Finally, participants and occasional visitors can access the interactive soundscapes already created and accessible through the Web and compose their ideal soundscape engaging their creativity and imagination.

3 Digital Annotation as a Digital Social Interaction Tool

The common “tool” in the example above is the annotation: in different ways, the annotation allows users to start a “dialogue” sharing information or emotional suggestions. In this section digital annotation is further explored in a *Banco Territorio*, a digital system for knowledge sharing and creation which is based on tourist maps [7]. In Fig. 3, a map of Banco Territorio, annotated with emoticons, is shown: emoticons – i.e., stylized facial expressions to denote human emotions and attitudes – are interactive icons each one permitting to open an “annotation manager”. In the annotation manager, a user can write her/his textual annotation as in WikiMapia. Moreover, the first annotation can begin a thread of annotations constituted by the annotations added by other users on this first note.

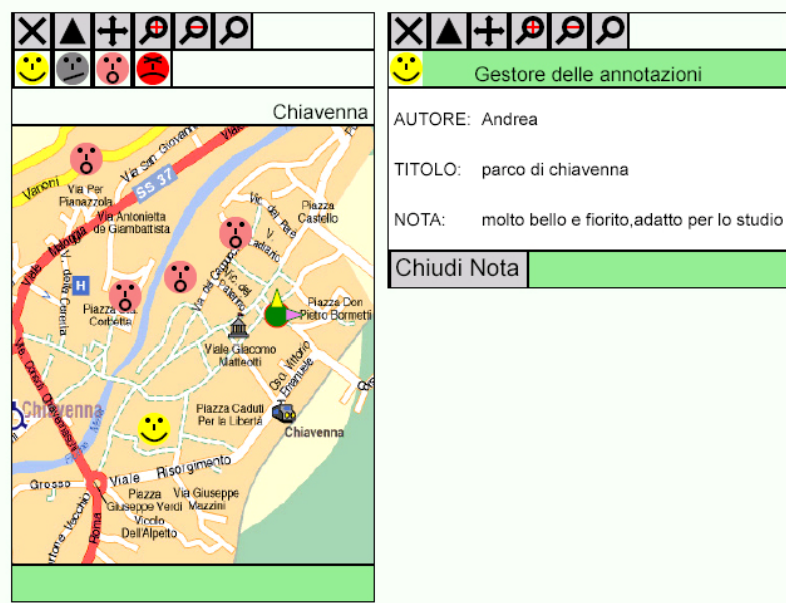


Fig. 3. A map and an annotation manager in Banco Territorio.

Banco Territorio project considers at most two different communities of users: (i) the generic users, which are for example tourists visiting the country represented on the map; (ii) the experts using Banco Territorio and the virtual maps to build and share knowledge, at a first step, with other experts and, in a second step, with generic users providing them with descriptions of relevant places in the country. Moreover, the publishing of annotations is controlled by a moderator (or a group of moderators): Banco Territorio can be considered as a moderated map-based wiki.

3.1 Social Knowledge arising from interactive annotation

The differences between the two communities determine also a different way to annotate the knowledge base. Experts feed the base with specialized content, enhance the informative and give the users new material to comment. The experts associate descriptive narrations with the map by means of a star operator: star operator opens an “expert annotation manager” in which the expert defines a text of the annotation and a context. The context is a query, defined by the expert, on a set of federated databases: the result of context query is a set of documents, such as images, related to the content of the text written by the expert. This means that only a part of the expert annotation is determined by the expert her/himself: the context depends on the contents in the databases. Experts are allowed to annotate over the annotations added by an other expert: in this way they can recursively create a thread of annotations that constitutes at the same time a discussion starting from the first annotation and also a knowledge enrichment through both the discussion (which can exchange the starting point of view) and the information addition. In particular discussions can disclose new ways to face an interesting topic related to the environment represented in the map. In Fig. 4, an expert annotation is showed: generic users can, in their turn, annotate the expert annotations through the usual way described above.

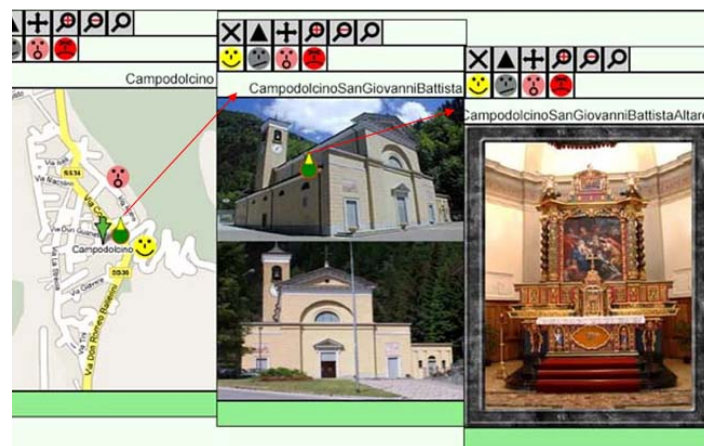


Fig. 4. A recursively expert annotation: the annotation is constituted by pictures of relevant monuments in the country.

3.2 Sharing Emotional moods through digital annotation

Unlike the pure documental nature of textual and graphical annotations, iconic and sound annotations allow the user of a map-based wiki to enrich the perception of the map space with an emotional layer, building an *emotional space*. In the “Silence of the Land” the emotional space is determined by the sounds added and reorganized by the users. In “Banco Territorio” the emoticons as emotional icons represented on a

map, allow to represent a kind of summary evoking immediately the emotive nature of the annotations. In the example in Fig. 3 and 4, the system provides the users with four emoticon types to denote a virtual annotation by visually expressing four different emotions: appreciation, surprise, disappointment or sense of danger. The emoticons provide Banco users with immediate visual indicators of the moods inspired in the authors by the entities being annotated. If interested, readers can select a specific emoticon and access the textual and graphical annotation content, which clarifies the reasons that inspired the expressed mood. The use of the emoticons together with the possibility to attach a sound to them, makes the annotations multimodal and provides a sort of synesthetic mode for sharing information about the country represented in the map. If several users put on the map different emotional states for the same point, the rendered emotion state will be a synthesis of all of them, while the specific icon related to a single note, will be shown besides it in the thread. Therefore, as it happens with the informative contents, where social interaction allows to achieve a common knowledge, so it happens with the emotional space, where plurality of annotations enables the representation of a common emotional level.

4 Overcoming cultural hurdles

A challenge and an opportunity in creating an on line or virtual social network is to overcome cultural boundaries. However, in the above examples, languages and symbols are cultural oriented: cultural hurdles and misunderstandings can arise. It is possible to overcome them in two ways: it is possible to define a sort of universal iconic language (Google itself seems to prefer this way) or it is possible to localize the whole language, not only the spoken (or written) language but also the iconic language, translating colours and symbols according to the cultural use.

In Fig. 3 and 4, the emoticon buttons in Banco Territorio are visualized according to the colors and facial expressions of European culture and conventions. Fig. 5 shows the Banco Territorio presented in Fig. 3 localized for a male Japanese visitor, where the same emoticons are visualized by using colors and graphical signs adopted in the Japanese culture. In the example, a same emotional state is rendered with a different emoticon whether the user is European or Japanese, thus giving a special attention to affordance and firstness of the icon, which must be the right one for the particular user culture. Localisation allows to go over cultural hurdles, in a very broad way: the interactive system enables users of different nationality to interact each others. The system fits in the user, with specific symbols, color, mode, and, if apposite translator are used, even in terms of textual content.

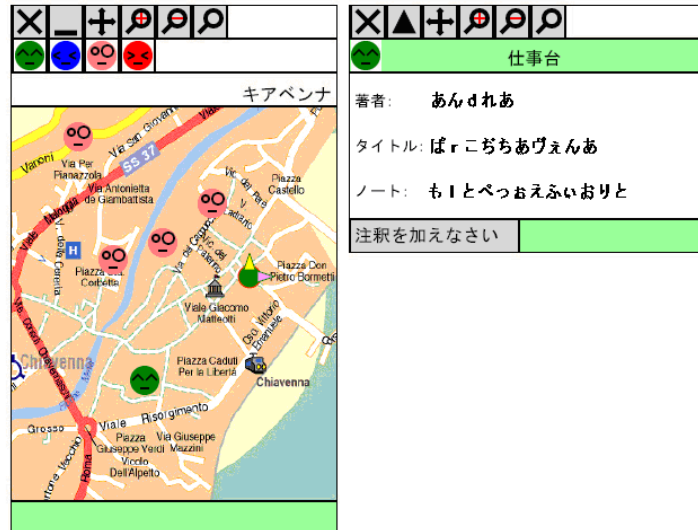


Fig. 5. Banco Territorio localized for japanese users.

5. Conclusion

The paper discussed the use of maps as boundary objects to create a social interaction between users different for knowledge and also for culture. An interesting point is how to share not only explicit content but also emotional moods in exploring a virtual space or a real space through digital annotation tools. Future work aims at further analyzing map-based wikis for social interaction studying multimodal annotation.

References

1. Freeman, H.: On the Problem of Placing Names on a Map, (2006)
2. Giaccardi, E.: Cross-Media Interaction for the Virtual Museum: Reconnecting to Natural Heritage in Boulder, Colorado, (2007) In: Kalay, Y., Kvan, T., Affleck, J. (eds.), *New Heritage: New Media and Cultural Heritage*, Routledge, in press
3. GoogleMaps, <http://maps.google.com> last visited on July 8 2007
4. WikiMapia, <http://www.wikimapia.org>, last visited on July 8 2007
5. FOAF project <http://www.foaf-project.org>, last visited on July 8 2007
6. Moody, J., White D.R.: Structural Cohesion and Embeddedness: A Hierarchical Concept of Social Groups. In *American Sociological Review* 68(1):103--127, (2003)
7. Costabile, M.F., Piccinno, A., Mussio, P., Parasiliti Provenza, L.: End-User Visual Languages as Guiding Lights to avoid Turing Tar Pit and its inverse. *CHIItaly'07*, Padova June 2007.