A new approach in cross-domain collaborative research

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Scientific research commonly faces the study of complex systems where multiple skills and competences are needed at the same time. Effective collaboration among researchers then becomes of paramount importance. Multidisciplinary studies imply the use of information and knowledge from domains that can be rather far from each other. Notwithstanding this, researchers, need to understand: what they handle, how to extract what they need and eventually produce something that can be used also by others. The management of information and knowledge in this perspective is not trivial.

To develop methods and tools able to support such activities we need to analyze how collaborative research takes place. Besides the standard view that picture scientists committed to their endeavour to achieve solid and undebatable results, modern epistemology and sociology of science added a more fluid perspective where science can be considered mostly a social construct conditioned also by cognitive issues. These aspects cannot be obliterated; on the contrary they need to be carefully taken into consideration. Information is to be built from different perspectives and ways of thinking by actors with different point of views, approaches and aims, and in this, data should be understandable by all the designated community. In fact different communities develop their own ways of thinking, language and even myths, in other words they can be considered such as different cultures. To address these issues we invoke two strategies: (I) to formalize all the knowledge relevant for the study. This will means resolving all conflicting models among actors; something that is theoretically and has been demonstrated practically, very difficult to achieve. (II) Exploit the results of ethnographic studies conducted in the 1990's that explained how the introduction of representative artifacts allow different cultures to understand and use the same concepts in a different way.

Both approaches have limitations and strengths, thus we propose to balance their simultaneous use: leveraging the formalization strength of web semantics while, at the same time, representing graphically snapshots of context dependent knowledge.

A web based collaborative portal has been developed that integrates both approaches. First tests are taking place with encouraging results.