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# Semantic Web and evaluation of learning

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The semantic web is an extension of the traditional web by introducing the meaning of the data and it adds new functionalities to machines which become able to understand and process the data, whereas now it simply displays the profile.

The activities of selection, contextualization and rendering of unstructured content can't be obtained from any computer. In other words, the information is readable but not understandable by the machine in order to make the meaning of the data web understandable by the computer, the data are combined with meta-information describing this content. Could the adoption of a forum in a semantic learning environment clear the way for the evaluation of learning that reflects a knowledge management in new ways?

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## 1 Training as an experience

The experience is nourished by the spirit of places (“places”) so we can not consider the virtual environment only as a place “not physical” where students perform a range of activities individually (reading / training lessons or other informations) and collectively (group learning activities such as chat rooms or forums or mailing lists), but it is important that the environment prepared by the participants of the course is perceived not only as a means of mere “transmission” of information, but primarily as a place of communication and a meeting place where educational and social activities ties between group members. Therefore, from this it follows that the student becomes an actor in the learning process and “builder of social knowledge” in the sense that each contribute becomes a piece of a picture that is becoming richer and more sense the more you go back on it: the personal intervention takes on added value in that it binds to a previous intervention thus subsequently be carried out on both (social interaction) coming to create a set of inputs (stratification) that gives rise to a sedimentation. In particular, thanks to the semantic web published documents (HTML pages, files, images, and so on) are associated with information and data (metadata) that specify the semantic context in a format suitable to the question, interpretation and, more in general, to the automatic one. With the interpretation of the contents of documents semantically structured, much more sophisticated searches are possible, based on keywords in the document, and other specialist tasks such as building networks of relationships and connections between documents according to the most elaborate of the simple logic hyperlink.

The added value of Semantic Web is to provide a language for expressing data and rules for reasoning about data, allowing the web of rules on the export of each system of knowledge representation. This is possible through the use of ontologies, which *define the concepts and relationships used to describe and represent an area of knowledge*, namely a knowledge representation scheme that can contain domains, concepts, classes, relationships, rules, judgments or sentences, and another set of semantic elements of their various types of artificial intelligence. The fully automated extraction of ontology quality, cultural factors, linguistic nuances and contextualization are some of the main challenges and the issues under investigation are still open because we can achieve as indicated by Schön: enable professionals to rethink not as “instrumental problem solvers” but as creative artists and “reflective” of their actions, their choices and their moves, through the exercise of an “artistic ability” characterized by emerging powers in unique situations, uncertain, conflicting with the aim of design new types of training to “teach and learn.” (Schön, 2006)

## 2 Semantic Web and evaluation of learning

### 2.1 The semantic web

The central role of semantic technologies was also highlighted by the research programs funded nationally and internationally, which aim to reflect on Collective Intelligence (CI) related to the manipulation of symbolic systems (Atlee, 1998-2010). This is due to two factors: 1) Collective Intelligence, such as human resource capacity to undertake collective intellectual synergies to create, invent and innovate is a key factor in competitiveness and human development in a knowledge economy or in an information economy, 2) reflection is needed on increasing healthy CI and digital networks. Therefore, it is no coincidence that the theme of strengthening infrastructure through digital networks is still an area of emerging research shows how the vast body of literature on knowledge management and how the growth of social computing attests. Moreover, according to some visionaries and intellectuals, the magic triangle CI-Semantic-Social Media Tech could trigger the next step in Web 2.0 ecosystem, which has its counterparts in the role that the invention of phonetic writing system Alphabetic played in the transition from societies based on oral cultures, myths, stories, or in the central role that the invention of the Indo Arab figures, including place value and zero, has played in arithmetic examples of Roman numerals.

In particular, we are questioning about a new approach to the complexity and scalability of systems and semantic reasoning, a more accurate reflection on the nuances of cultural, contextual and linguistic extraction of a high quality ontology through the analysis formal concepts, web search metrics and ontology, the problems of optimization of search engines, and the semantic service computing. It sheds new light on the evolutionary aspects of complex adaptive systems. The Web as well as any social networks and new media knowledge is conceived as an organism, an evolving ecosystem, the sustainable growth of which is subject to conditions or restrictions, and to the cost-benefit models. (Cimmino, 2010)

### 2.2 The assessment of learning

Measured is not valued. The terms Measurement (Measurement) Determination (Assessment), Assessment (Evaluation), assume specific meanings. The “measurement” refers to the process through which determine the characteristics or the size of some physical object. An exception seems to be the use of the word ‘measured’ in determining the IQ of a person, or his attitudes or preferences.

The “Assessment” is a process by which information is obtained relative to

some known goal or purpose. All tests are tests, but not all tests are tests. We test at the end of a unit or lesson. We assess progress at the end of the school year through tests, and evaluate the quantitative and verbal skills.

Whether implicitly or explicitly, the assessment is closely related to the objectives or goals for which the assessment was designed.

In this sense, we make certain we test or to determine whether an objective or goal has been reached. Ensure ability is fairly simple. Skills, to an acceptable level, or there are or are not there. Make sure the understanding is more complex and difficult. Skills can be demonstrated, not understanding. Evaluation is perhaps the most complex and least understood of these terms. Inherent in the idea of evaluation is the concept of 'value'.

When we consider we are engaged in a process that is designed to provide information that will help us make a judgment about a certain situation. As defined in the site ADPRIMA, evaluate means to classify objects, situations, people, conditions, etc. according to certain quality criteria.

Indication of quality must be reported within the criteria defined for each class category.

### 2.3 The role of semantic web in the evaluation

The "Semantic Web" or "Semantic Web", not separate from the Web "traditional", but introducing the meaning of the data, it is an extension that adds new functionality to machines, which become able to understand and process the data, which until now simply would display. So, if until now the Web was a medium for the transmission of documents between people, thus becoming a source of data and information that can be processed automatically. Adding semantics to web content requires the creation of languages and technologies to extract meaning from information.

In particular, for the development of a Web version semantics is configured as necessary to the development of a language that allows to express data and rules for reasoning. The creation of a Semantic Network, as envisioned by T. Berners-Lee (Berners-Lee *et al.*, 2001), aims to ensure that computers become capable of managing the information and automatically "learn" to achieve a number of processes in an accurate, continuous and repeated.

The meaning that the machines will be able to process is obviously something different from what is at stake in the communication between humans, the machines are certainly not able to really understand what they will be asked, but should be able to recognize those information that are important for users, with software which should be equipped for this purpose.

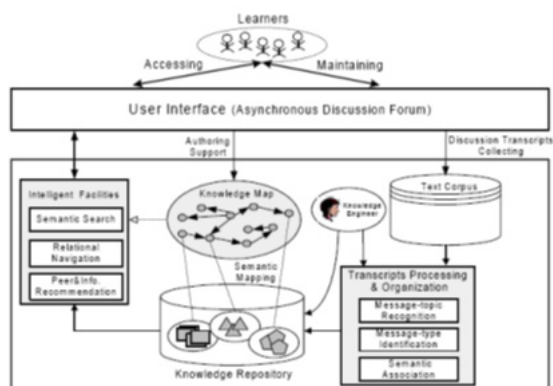


Fig. 1 - The semantic framework for designing a forum (Li *et al.*, 2009)

The adoption of a semantic forums (Fig. 1) in a learning environment (Li *et al.*, 2009) may open the way for an assessment of learning that reflects a knowledge management with new modes: automatic acquisition of more tacit knowledge, know-how of the people (Presti & Cimmino, 2010). If the environment for the exchange of information is intended for use by humans, and all documents published on the web are designed to have the human being as an end user, you may find that the information available, whether text or images assume a semantic value at the moment when they are interpreted by the users. But if the selection, interpretation and contextualization of unstructured content can not be achieved by any computer, in other words the information is machine-readable but not machine-understandable, we must further reconsider a second structured information standards that allow more the computer from knowing which bits of information are the meaning of a document on line, so the “meaning” of the data transmitted on the Web is “understood” by computers, and you can proceed to the semantic evaluation in a learning environment. In this way, software agents may be able to perform more automatic acquisition of tacit knowledge with the use of a source of content, eg. in the medical field to PubMed, which is based on a multi-lingual medical ontology, built from the terminology of a thesaurus known as shared MeSH (Medical Subject Headings, for details see <http://www.nlm.nih.gov/mesh/>) by combining several translations of the MeSH terms. The challenge we face in the near future will be how to rethink the assessment in a semantic environment, for the chance to assess their experience and knowledge (external, internal, explicit, tacit), how to assess intelligence (collective and connective), as expressed by users, with the automation of meta-data “machine-understandable” in an environment that allows the user to make queries in their own language, leaving the task to the

engine to “recognize” the meaning of the query, search relevant medical literature from PubMed, which has been compared semantically indexed medical ontology, and if so, to expand his query related concepts.

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