Towards Supporting New Professional Skills in Computer-Mediated Interaction

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Abstract—The technology introduction and diffusion operated a transformation in the job market determining the creation of new professional expertise and the development of technologies to support the collaborative building of knowledge. In this paper we analyse the role of the communities of practice and highlight the importance of the intelligent analysis of computer-mediated interactions for the creation of new professional knowledge.

Index Terms—Communities of practice, collaborative building of knowledge, modeling interaction, professional skills.

I. INTRODUCTION

In a job market radically changed by the introduction and diffusion of the information and communication technologies, the question of the expertise and of their updating is a central factor. Indeed, not only the professional skills represent an essential pre-requisite for accessing to most job activities, but also the individual capacity to keep these competences in step with the development of the technologies and to increase them, turns out to be a determinant factor for having a successful career and safeguarding the job place.

In such a context, a valid contribution to the development of the professional expertise can be recognized to the experience of the communities of practice. These environments, which are very significant for the continuous learning, can be identified with the operating space where you can cultivate the competences required by the knowledge society. In the communities of practice the interaction plays a fundamental role in the process of learning and sharing the knowledge. In particular, we can say that the building of new knowledge takes place in the interaction among the members of the community.

The use of the communities of practice for developing expertise offers several advantages, first of all the possibility of exceeding the barriers imposed by geographic distances, thanks to the interaction through technology. Moreover, the database of a community of practice, constitutes a precious tank of knowledge immediately shared by the members of the community itself.

However, the quality of the interaction considerably affects the quality of the knowledge building process: the members are not always provided with the skills and expertise necessary to lead the interaction in a constructive way, having care of solving shared problems, structuring new knowledge, and sharing the existing one in an effective and efficient way.

A solution to this kind of difficulties consists in providing the communication environments with forms of intelligent analysis of the interaction, that is with algorithms able to monitor the interaction and bring it back on the tracks of the building process of new knowledge, which is one of the long period aims of our research, as well as a fundamental goal for the scientific community operating in this domain [1, 15, 17, 22].

II. DIGITAL EXPERTISE AND JOB MARKET

The digital expertise at any level, from the most elementary to the specialized one, represents a key element for the economic and social growth. About ten years ago Europe based on the updating of its learning system its aim of becoming “the most competitive and dynamic economy of the world funded on knowledge” [28]. The Recommendation of 2006 [29] clearly says that the digital competence not only includes techno-practical knowledge, skills and attitudes, but also requires the development of a critical approach together with the awareness of the opportunities offered by the new technologies in all the fields of the daily life, and the risks connected.

In 1997 Paul Gilster [12] introduced the term “digital literacy” matching the technical skills required to use new technologies with cross-cognitive abilities.

The digital literacy, characterized by multidimensionality [18] and subjective performance of social sub systems [9], is allocated inside a «network of correlated terms and concepts»: the ICT literacy, referred to a specific media, the Visual literacy and the Information literacy, less dependent on the technology adopted, but equally relevant to define the digital competence [18].

From an operative point of view which involves the development, delivery, and assessment of this specific competence, we may refer to the ICT literacy model designed by the International ICT Literacy Panel [7] and its evolution proposed by Calvani, Fini and Ranieri [2]. Starting from these studies, we can identify two fields for the digital competence: a techno-practical field, which directly depends on technologies and their evolution; and a cognitive, ethical and social one concerning knowledge which is independent from technology and its development.

In this perspective the relation between expertise and new professions or "renewed" professions assumes a particular relevance. The maintenance and increasing of professional expertise in our knowledge society is not just a matter of technical upgrading. Independently from the activity area, - the ITC or the Health, Training or Communication - the comparison with new technologies overcomes the consultation and study of technical...
manuels or publications. On the contrary, it requires the use of the critical thought, typical in digital competence, which allows the relation to be creative and conscious.

III. COMMUNITIES OF PRACTICE AND EXPERTISE

The qualifying element of the communities of practice is their ability to learn [6]. The exchange of experiences among people with the same professional interest, the mutual help, the comparison and sharing promote a process of mutual learning [27], which supports the professional growth and updating of the members and causes a consequent significant improvement in terms of productivity and of development.

The concept of community of practice rises in the context of sociological and anthropological studies which recognize the active nature of the learning process, intimately correlated to the action of the individual [14]. It overcomes the traditional vision where the learner is considered as a passive subject who acquires abstract and formal knowledge proposed by others [5]. The communities of practice are therefore the place of the learning as social participation [30]; not an individual activity, but something concerning the person in his/her totality, and then, also the context where that person lives and works.

The features of these aggregations are expressed through the terms “community” and “practice”. The first underlines that people are gathered not on the basis of a normative corpus, but thanks to the reciprocal confidence. The second term expresses the reason of the aggregation: the experience of doing something together justifies the need to be in contact one each other, sharing abilities, intuitions, perceptions coming from the historical and social context where the activity is developed. They are two strongly interdependent factors: the practice is the aggregating element of the community, but the community gives sense to the practice sharing.

We can say that the communities of practice take the man's progress. Wenger, the sociologist of the learning who invented the term, points out that these aggregations are not new. They rather appear to be the today's expression of a natural sociability, the answer to the man fundamental demand of going beyond individuality and sharing with other people knowledge and experiences in order to get a personal and community benefit.

The communities of practice turn out to be in fact the most appropriate answer to the challenges of the current knowledge economy; a source of innovation and learning [6], which allows to manage and exploit the so called intellectual capital, a strategic resource of each enterprise.

A. The role of interaction in the community of practice

The success of a community of practice is determined by the technological environment through which the communication and the cooperation among its members take place. Not only technology allows to eliminate the space-time bounds but also facilitates the knowledge transmission and management, which is the main goal of a community of practice. It is an infrastructure through which communication, cooperation and knowledge capitalization are carried out, taking into account the impact of technology on interpersonal dynamics.

As members of learning communities [6], they learn through conversation and cooperation [13]. For this reason, in the planning phase, it is important to elaborate a model of dialogic flows of the community, not to force the communication in a rigid grid - spontaneity is inalienable -, but to arrange the conditions for obtaining an effective and consistent communication.

In fact, if the tacit knowledge is the raw material of a community of practice and the explicit knowledge is the product, then we can consider the interactions among the members of the community as the strength which feeds the productive cycle. Therefore, knowledge emerges, spreads itself, is generated through exchange of experiences, comparison, and common search of solutions to specific problems.

The state of the art of the research in various domains shows how the knowledge sharing in collaborative online environments is a key factor for the creation and diffusion of new knowledge [21,15,17]. The communities of practice are conquering great importance and provide a fertile ground for group learning processes which support, in their turn, the diffusion of a wide repertoire of shared knowledge [30,31].

IV. ANALYSIS OF INTERACTIONS IN THE COMMUNITIES OF PRACTICE

The variety of technologies available nowadays, together with the specificity and originality of each community of practice, makes it difficult the recognition of a favoured tool, unanimously adopted to exercise in an effective way the formative function of the community of practice.

Besides, the abuse of communication and sharing tools leads to the spreading of information and causes difficulties in its retrieval for reaching high-level expertise.

Surely, the Web World cannot be considered, tout court, an environment of “knowledge learning ” and sometimes chats, forum or social networks are used for futile exchanges [3]. So is it important to define a method for the analysis of the dialogic interactions carried out by technologic tools in order to evaluate their effectiveness on the creation and diffusion of new knowledge and be able to intervene with appropriate strategies to correct and improve processes and behaviours.

In order to monitor and correct the behaviour of the members of the communities of practice, we can use the BDI agents (Belief Desire Intension) [24], which may be implemented so to exploit the conversational analysis techniques. Such a method for the real-time survey of behaviours not corresponding to problem solving “good practices” will have the purpose to guide the interlocutors towards more effective and constructive interactions.

In this work, we propose the combination of linguistic analysis methods (to identify the “communicative weight” of each intervention) with interaction pattern analysis methods (to analyse the total attitude of the participants to the discussion). In particular, a conversational analysis module is able to highlight the type of current activity (exchange of information, negotiation, possible conflict, ecc) by observing the matching of the trend of the interaction with typical patterns used in an effective an efficacious exchange of information and knowledge.

The implementation of such a method as behavior of a software agent that constantly monitors the interaction...
occurring through different communication tools, allows to decide when to intervene in the conversation to correct participants’ possible wrong behaviours (for instance solve or prevent conflicts or avoid unsuccessful digressions).

The proposed approach has something in common with Soller study [25], where the episodes of real knowledge sharing are distinguished from the breakdowns and automatically recognized through the use of the Hidden Markov Model [4,23].

However, the interaction analysis, may be also useful in environments where the dialogue is not structured or driven by an interface developed ad hoc, as it happens for the interactions on the web. The chance of analysing and monitoring the interactions according to Soller’s approach [26], applying it also to this kind of conversations which are not structured, increases, from our point of view, the cognitive capacities and the development of expertise.

V. CONCLUSIONS

This paper intends to highlight the importance of the use of intelligent tools for monitoring the interaction activities in knowledge creation and sharing. In particular, defining the importance of the communities of practice in forming new expertise required by our digital era, we focus on the necessity of integrating the communication tools with intelligent monitoring tools.

The essential features of this intelligent environment allow to recognize wrong behaviours in the communicative interaction in order to avoid paths which may damage the knowledge building/sharing process.

REFERENCES


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