Hybrid Knowledge Networks Supporting the Collaborative Multidisciplinary Research

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INTRODUCTION

Virtual networks are becoming increasingly important instruments for knowledge and collaboration management. In addition, research, development, and innovation performances are among the most important activities in modern organisations. These two issues deal with complex problems that companies, universities, and other organisations can only face with multidisciplinary, geographically widespread teams.

This article describes the setup of a model of a hybrid knowledge network that can group and connect together universities and researchers and enable them to collaborate. The proposed model for the virtual network is based on the conjunction of the personal and organisational aspects of collaboration. Due to this union within the organisational structure, two main levels of collaboration have been envisaged, namely the institutional one and the individual one.

BACKGROUND

Nowadays, it is claimed that the main source of sustainable competitive advantage is based on the possession of valuable information and the capacity to exploit, produce, and obtain new knowledge.

Networks in general, and virtual networks in particular, have gradually become more and more important instruments for knowledge management. Early references in this field can be found in the research made by Drucker (1989), Savage (1990), Keen (1991), Donaht (1998), and Koch, and Wörndl (2001). A huge number of definitions have been identified to characterise collaborative networks and the organisation of communities of practice (Koschtzky, 2001), but it has been quite difficult to define a clear border between the different types of knowledge networks that exist.

In the research and development (R&D) process, there is no doubt that communities of practice as specific forms of such networks have become the most important tools to implement knowledge management and to accelerate the transference of innovation. They bring together people with common goals and interests who are physically remote and are working in different types of organisations. Using new technologies they can join together and work as a team towards the objectives set.

This article deals with a new form of knowledge network which, on one side, groups together elements from the traditional virtual community of interest and from the more sophisticated communities of practice, and on the other side, promotes collaborative multidisciplinary research that produces high-quality research results and stimulates their transfer.

MAIN FOCUS—KNOWLEDGE NETWORKS: CONCEPT AND APPROACHES

The main concept treated in the networks economy theory is the cooperation between organisations based on the mutual trust, without hierarchical structures, and that considers knowledge networks as an intermediary stage between the free market and the rigid organisation. In their theoretical approach to the concept of knowledge networks, Seufert, Krogh, and Bach (1999, p.182) define them as structures established between individuals, groups, and organisations in which not only bilateral relations, but also all activities carried out by the knowledge network are important.

From the socio-economic viewpoint, networks are interpreted as a specific set of linkages between a defined set of actors, with the additional property that the characteristics of these linkages as a whole may be used to interpret the social behaviour of the involved actors (paraphrased from Mitchell, 1969, p. 2, as cited by Alba, 1982, p. 40). Therefore, the term "network" covers strong social relationship and includes players who may be individuals, groups, or even whole companies. From this viewpoint, networks can be structured formally or informally. The relationships that can be identified within them are interpreted as long-term connections, which may be personal/organisational or technological/organisational.

Knowledge networks usually share a series of characteristics among which, most important according to Seufert et al. (1999) and Real Communities Inc. (2000), are the following:

- Networks exist to *create and disseminate new knowledge*.
- They are structured and operate to *increase the rate of creation* of new knowledge.
- They provide *clear, recognisable benefits* to all participants.
- Network *membership is by invitation, based on merit or prior review* of the purposes of the project.
- Networks are *usually inter-disciplinary, and cross over the frontiers* between sectors of activity and areas of knowledge.
- Through networking, a *transfer between the tacit knowledge of individuals and the explicit knowledge* held at organisations takes place.

COMMUNITIES OF PRACTICE

The term "communities of practice" was presented first by Lave and Wenger (1991). These communities are groups of people who share an interest in a domain of human endeavour and engage in a process of collective learning that creates bonds between them. A basic characteristic of the community of practice is the specific way in which learning takes place, through a process of *"legitimate peripheral participation"* (LPP). Therefore it is not exclusively based on practical teaching, but also comprises a process of development of knowledge based on experience. The elements of legitimacy, participation, and peripheral define specific characteristics of communities of this type (Wenger, 1999).

Communities of practice therefore have the role of integrating specific knowledge¾that is, turning individual knowledge into collective knowledge according to the capabilities of the team involved. In short, the creation of "team knowledge" is the result of interaction between individual and collective knowledge, and between tacit and explicit knowledge, according to the development of the "knowledge spiral" (Nonaka & Takeuchi, 1995).

There are certain features that distinguish communities of practice from formally configured teams (see Table 1).

Some Key Factors for Success of the Communities of Practice

- **The knowledge network should be focused on the needs of its members.** In line with this, management should seek to study the profiles of members: what knowledge they possess and what they need.
- **The knowledge network must invest in content.** Much of the effort put in must go into the generation of new content and new contributions, as this is the only way to increase the knowledge of the organisations.
- **Adopt the assumption that the community cannot operate on its own.** This means that members must identify who can act as informal moderator and lead the remaining members towards the problems to be dealt with and provide basic working methods.
- **External factors like the organisational culture are extremely important.** One of the main aims of group moderators must be to achieve a common culture so that knowledge sharing is a natural activity, not a special effort.
- **The understanding that the activities of knowledge network are not limited to discussion groups.** Communities are much more complicated than that.

As a concluding remark for this section, online communities can be said to hold clear advantages for research groups.