Towards Modeling of Communities of Practice (CoPs)

A Hebbian Learning Approach to Organizational Learning

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ABSTRACT

This article addresses the issue of group learning, which is an emerging philosophy in the field of organizational learning. Although not all groups learn, those that do and form spontaneously have been referred to as Communities of Practice (CoPs). These groups appear to be very important among professional and dynamically interactive organizations. Members of such groups come together mainly due to exposure to a set of shared problems, professional and/or social. These members interact directly and use each other as sounding boards for new ideas and help each other learn. Both the business and academic fields have come to recognize CoPs as one of the most important structures in learning institutions or organizations. Identification, cultivation and maintenance of such groups has become a key issue in the field of knowledge management. If CoPs are one of the mechanisms by which organizations learn then it would be useful to acquire greater insight into these groups. In this article, we propose an analytical model of CoPs based on the neural network concept of Hebbian learning. Computer simulations are used to test the analytical model.   © 2000 Elsevier Science Inc.

1. Introduction

The field of learning organizations has transformed itself from the fad of the late 1980s—as Senge [1] described it[1]—into a main stream discipline pursued by both the

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[1]The use of word fad; derisive as it sounds should not reflect on P. M. Senge's contribution to the field of organizational learning. He is the founder and director of the Center for Organizational Learning, Sloan School of Management at MIT. He has been credited with the blueprints for creation of learning organizations.

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business and academic communities. Of recent interest in this field has been the study of Communities of Practice [2], an informally organized network of agents who share common interests and goals. According to some researchers almost all learning in organizations happens inside Communities of Practice [3] (henceforth referred to as CoPs). Even if one discounts this claim, organizations would still be interested in identifying and cultivating such groups. In fact, they are of interest to any industry that relies on its knowledge-base to create new technologies, processes, products, and services [4]. Since the rise of global markets and competition in the early 1990s the economic landscape has changed for most industry sectors. This change is very intense in the technology sector because of open markets and the complexity of rapidly changing technologies [5]. Exposed to international competition, technology-intensive industries have the need to develop global strategies for the sale of goods, services, and the sourcing of raw materials.

Porter [6] has described the effects that pervasive, continuous technological change and widespread economies of scale have on technology sector industries. In an environment characterized by rapidly changing technology and increasing productivity, the creation and acquisition of new knowledge are of great importance to technology-sector industries [7]. Thus an organization that wishes to participate and prosper in the global markets in most cases will have to produce innovative products and services, use leading technology and make efforts to develop new technologies to increase productivity for its survival. But such efforts require the existence of a competitive knowledge-base inside the organization. By its very nature such a knowledge-base is distributed and is tied to that organization's human capital. To stay competitive an organization must maintain and update its knowledge-base which requires a process of constant learning at the organizational level, which unlike individual learning necessitates social interaction. The distributed knowledge-base consists of knowledge networks whose nodes are characterized by individuals and the links between these nodes are the potential knowledge paths that facilitate the exchange of ideas and concepts and, therefore, knowledge. The maintenance and growth of such knowledge networks in organizations creates the learning organization [8].

In the recent past, considerable efforts have been made to understand various aspects of organizational learning [1, 9]. Pralhad and Hamel [10] help define an organization's core competencies as a bundle of skills spanning the entire organizational structure which help to meet customer needs. Kotter [11] discusses how organizations can cope with changes, as a very desirable property in responding to changing external circumstances. Dibella and Nevis [12] help develop a typology of organizations in terms of the kinds of learning that takes place: developmental (last stage in the evolution of an organization), innate (each organization learns according to its capability perspective), normative (learning under special circumstances). Various aspects of the management of learning organizations have been discussed by Cavaleri and Fearon [13]. Scott [14] treats organizations as complex adaptive systems. Still others [2, 3, 15, 16] have advocated the concept of a Communities of Practice (CoPs) type of organization. Such organizations are based on loosely connected groups of individuals [17] who share common interests similar to network organizations where nodes represent the individuals, and the bonds between these nodes represent the strength of a set of common interests that bind them together.

If these groups are important to organizations, then identifying and cultivating them would appear to be beneficial. Organizations may create an environment or adopt policies to help such groups emerge and flourish. For example, a computer technical