Chapter 34
Online Collaboration

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ABSTRACT

In this chapter, the authors present the general framework for assessing collaborative work group behaviour over the Internet and their social or asocial behaviour based on previous studies. Following this approach, the authors first give reference to a related study on social and asocial learning and how they can be distinguished through the analysis of data diffusion curves and other mathematical models. As a next step, a used method on group collaboration over a digital content publication platform is presented. Finally, the authors state a new direction on collaborative work groups, and the idea of Collaborative Innovation Networks is presented. The paper ends with directions for future research on social networking and human-machine collaboration.

INTRODUCTION

The introduction of social networking and the fast growth it has enjoyed over the past few years, together with the advances in communication technologies have elevated the importance of web based communication and collaboration, including the involvement of personal communication and socialization. What was traditionally served through direct human contact and communication through speech, gestures, expressions and even physical contact (i.e. a handshake), is now served through the equivalent web substitutes: video communication, chatting through text, SMS and blogs.

In this new situation, where even our social lives are being served and even influenced by the use of web technologies and tools, online work and collaboration of groups is bound to be affected, adopting new patterns, tools and ways to be served. Furthermore, modern communication patterns, influenced by IT technologies that allow the easy formation of linked groups at personal

or professional level, provide the framework for a more efficient on line communication and collaboration.

In the following sections, the general framework of human collaboration and the behavioral patterns behind it will be presented, together with ideas on how this collaboration can be used to advance innovation, concluding with concrete application examples. Complementing this with future trends encompassing the idea of human-machine collaboration on a human-centric approach, the final section provides ideas on next generation-holistic collaborative systems.

OVERVIEW

In order to address the issue of online collaboration, we should examine first the patterns that bend the collaboration of humans (in some cases even animals since many of the observations from the animal kingdom apply to the case of human interaction), and also to elaborate on the way these patterns are transformed through the use of internet technologies and IT technologies in general. Furthermore, we should take into account the different flavors of collaboration in the form of culture-ethics, collaborative work and learning. Going beyond the study of direct applicability of experience and collective knowledge towards collaborative efficiency, there are two directions in which online group collaboration can be exploited: the first is to promote the way innovation can emerge through the collective contribution of ideas, assisted by the web and the internet, and the second is how it can best serve the intelligent communication between human and machine, over a more efficient framework inspired by human socialization, as this is served and influenced by ICT: namely social networks.

Following this rationale, the rest of sections cover all the referenced areas following the reported sequence of presentation, while a concrete application example of online group collaboration is presented in order to support the theoretical results reported.

Social/Asocial Group Behavior

In the past years, the determination of whether a particular behavior pattern is acquired through social or asocial (individual) learning methods has been the subject of extensive research. In this area several methods are presented for distinguishing social and asocial group behaviour by analyzing diffusion curves. A diffusion curve is a representation of the temporal spread of a behaviour pattern through a group, formed by plotting the cumulative number of individuals demonstrating that behaviour pattern against time. This is a new way for addressing the issue of how information is spread through a population against old methods that were based on animal studies and laboratory experiments (Orzan, 2008).

Social learning refers to learning that comes as a result from the observation of or interaction with another animal or its products (Heyes, 1994). A method for diagnosing whether learning is social or asocial is the shape of the diffusion curve. If the cumulative curve that describes the diffusion of learning behaviour represents nonaccelerating functions (e.g., linear or logarithmic) then the learning model is considered as asocial. On the other hand, accelerating curves allow the diagnosis of social learning behaviour.

Moreover, several mathematical models have been developed in order to predict the spread of novel traits among humans and have been applied to animal social learning. In the case where cultural innovation acquisition is followed for a sufficiently long period, the cumulative curve "almost always follows an S-shaped curve" (Cavalli-Sforza, 1981) and this corresponds to a sigmoid diffusion curve. In this sigmoid pattern, it appears that as the trait spreads, the number of demonstrators increases (enhancing the opportunity for social learning in

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