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701 E. Chocolate Avenue, Suite 200, Hershey PA 17033-1240, USA ITB10835

Tel: 717/533-8845; Fax 717/533-8661; URL-http://www.idea-group.com

Chapter X

"Let Me Know What You Know"

ReachOut as a Model for a Peer-to-Peer Knowledge Sharing Network

Vladimir Soroka, IBM Haifa Research Lab, Israel

Michal Jacovi, IBM Haifa Research Lab, Israel

Yoelle S. Maarek, IBM Haifa Research Lab, Israel

Abstract

Peer-to-peer (P2P) technology has spread through the Web over the last few years through several incarnations, ranging from search for extraterrestrial intelligence to multimedia file sharing, or resource sharing in the general sense. Collaboration systems, expert finding systems and recommender systems are all examples of resource sharing tools where the basic resource is "knowledge," yet they are not viewed as peer-to-peer due to their centralized architecture. We claim that the process of knowledge sharing in such systems is ofter P2P, regardless of their architecture. This

chapter analyzes knowledge sharing and collaboration models through the prism of P2P technology. We propose a framework for determining when knowledge sharing systems follow a P2P model, review existing collaboration and knowledge sharing systems, and verify whether they qualify as P2P under the criteria we define. We then introduce our "Second-Degree Peer-to-Peer" model for knowledge sharing and illustrate it with ReachOut, a tool for peer support and community building developed at the IBM Haifa Research Lab.

Introduction

Peer-to-Peer (P2P) technology has clearly crossed the chasm[1], and some of its applications have been so widely adopted that they clearly can be seen as killer applications of the Internet era. P2P is used for a wide variety of purposes. Examples include search for extraterrestrial intelligence (SETI@Home), peer-to-peer instant messaging (P2PMessenger), and telephony services (Skype). Yet the most prominent usage of P2P is multimedia file sharing[2] (mostly for songs and video clips), as offered by numerous applications such as Napster, Kazaa, Gnutella, and eMule. Multimedia is not the only type of resource that may be shared. If P2P systems are effective for multimedia sharing, they should also be effective for the sharing of other resources such as knowledge. Collaboration systems (Groove), expert finding systems (Ackerman, 1994; Ackerman & McDonald, 1996), and recommender systems (Terveen and Hill, 2001) are all examples of knowledge sharing tools. However, these systems have rarely been viewed as peer-to-peer due to their centralized architecture.

The question we address here is whether a centralized architecture really disqualifies a tool from belonging to the P2P class. In Napster, for instance, while the actual media sharing is done directly between two users, the initial lookup is performed on the central server. This leads us to believe that a more generic definition is needed for qualifying systems as P2P systems.

We argue that knowledge can be seen as a resource suitable for sharing and exchange under a P2P model. Many current knowledge-sharing tools have elements of P2P in their design and implementation. We will review here these existing tools and assess how they may benefit from P2P aspects. In order to illustrate our purpose, we consider and study within this context, ReachOut—a tool for peer support, knowledge sharing, and community building created at the IBM Haifa Research Lab.

The rest of this chapter is organized as follows: We first define knowledge and justify why it is an exchangeable resource in P2P systems. We then propose a