Chapter 2
Enterprise Knowledge Preservation and Management

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ABSTRACT

The decision making process in organizations is constantly evolving with expanding geographical boundaries and ever-changing technology landscape. A major part of decisions and deliberations now typically takes place in collaboration platforms like emails, enterprise social networks, discussion servers, chats, and conferencing services. These platforms contain problem solving insights, recommendations, best practices, expert opinions, and answers, and must be considered part of the organizational knowledge management effort. However, traditional knowledge management techniques do not sufficiently capture the hidden nuggets of knowledge buried in communication logs. In this chapter, the authors describe the need for a paradigm shift in knowledge management strategy and propose semantic social network analysis as a potential solution. They introduce the concept of social knowledge networks and describe knowledge algebra by defining rigorous social metrics. Finally, to demonstrate the applicability of the approach, the authors provide two case studies that lead to identification of experts and mining of best practices from informal communication at the workplace.

INTRODUCTION

Decision-making relies on accurate data, sufficient background context on data, and efficient knowledge management (KM) by teams operating on such data. The difficulty in searching for the right data is only a small part of the problem, which however becomes crucial when integrated views of data are required to make important decisions efficiently and effectively. Integrated data views are difficult to produce, since data are being generated and stored under different formats and schemata,

pertaining to multiple vendor products. Expert team formation is also inherently difficult, since it requires search and identification of experts, capable of collectively making decisions under well-defined contexts, often under tight time schedules. In our view, the source of difficulty is that knowledge in all its forms (e.g., about data, people and practices) is currently ill identified, stored and indexed.

Traditional media like SharePoint[1] and Office Communicator[1] are heavily utilized as part of question-answering and problem solving processes, while e-mail is used for information sharing among coworkers. Microblogging capabilities have lately penetrated the enterprise environment (Zhang, Qu, Cody, & Wu, 2010) providing yet another medium for users to share day-to-day operational knowledge and domain knowledge, discuss problem solving, emerging techniques, applications and technologies, trends, etc. Organizational hierarchy provides a formal structure for the bulk of e-mail and/or social traffic to follow. However, informal interactions through corporate microblogging services span organizational charts, facilitating knowledge generation in the form of direct problem solutions or links to external sources (for example textbooks, research papers, frequently asked questions and best practice documents). Knowledge in such cases may not have been formally represented initially. Only when a specific question is being asked and an expert answer is provided, knowledge can be formally modeled and captured. We argue that knowledge capturing, analysis and utilization in this context can be achieved by monitoring informal communication activities throughout the corporate social web.

Informal communication is inherently noisy both in terms of presentation (e.g., unstructured, ungrammatical text) as well as knowledge quantity and quality (e.g., personal status updates generally contain information, but not knowledge). In particular, workplace relationships built between coworkers using microblogging services may be either personal or professional. We argue that knowledge can be generated in both contexts alike, even though knowledge revolving around professional relationships is typically "different" than knowledge created on a personal context.

In this chapter, we explore the need for a paradigm shift required to capture collective knowledge, which is generated and shared without being limited to a specific language or system, but encoded in multiple formats, and distributed over time. We describe a system under development, called Social Knowledge Network (SKN), designed to enable collective intelligence capturing, preservation, management and analysis over (in)formal interactions. In addition to outlining the general structure of the architecture and discussing important aspects of it, we demonstrate its effectiveness by presenting two constructive applications.

BACKGROUND

A knowledge base is a system that enables domain knowledge collection, organization and retrieval. The Artificial Intelligence community has widely used knowledge bases in order to represent knowledge using rich modeling languages. Formal knowledge modeling and representation in the form of logic rules makes knowledge consumable to machines, enabling previously unknown and/or non-obvious knowledge generation through automated deductive reasoning. Semantic Web technologies use formal schemata instead of rules to capture the structure of stored data (i.e., entity types and relationships between them), and exploit such representation to discover non-obvious relationships between nodes using inferencing.

Knowledge is generated, captured and shared without being limited to a specific language or system, but encoded in multiple formats and distributed over various repositories. In large organizations knowledge can be in the form of standard operating procedures, questioning and

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