Chapter 142
Taxonomies of Knowledge

Phillip Ein-Dor
Tel-Aviv University, Israel

Category: Theoretical Foundations of Knowledge Management

INTRODUCTION

Knowledge management has become a major application of information technology (IT) and a major focus of IT research. Thus, it becomes increasingly important to understand the nature of the knowledge object and knowledge engineering processes. The assumption underlying this article is that in order for knowledge to be managed by technological means, it must first be represented in the relevant technology. As Sowa (1999) puts it:

Knowledge engineering can…be defined as the branch of engineering that analyzes knowledge about some subject and transforms it to a computable form for some purpose.

The purpose assumed here is the management of knowledge for organizational aims. The other key term is "analyzes knowledge"; to analyze an object, one must first describe it, and taxonomies are intended to facilitate description and analysis.

A useful analogy is that of taxonomies of living creatures which employ multiple characteristics such as size, number of legs, blood temperature, and many more to assign specimens to categories.

As different kinds of knowledge require different modes of representation, taxonomy becomes the central link between knowledge engineering and knowledge management. For example, accounting data are represented as data records; routine manipulation of the data is performed employing accounting knowledge embedded in programs. Organizational use of accounting data may be mediated by expert systems, which are generally realized as a special form of rule-based programs. Thus, in order to effectively design a knowledge management system, one must first classify the types of knowledge to be embedded in it. Hence the importance of a taxonomy of knowledge. A definition of knowledge is itself knowledge; thus, this article deals essentially with knowledge about knowledge—that is, meta-knowledge.

Knowledge is a highly multidimensional phenomenon and can be studied from many points of view. Thus, Sowa's (1999) book titled *Knowledge Representation* is subtitled *Logical, Philosophical,*

and Computational Foundations. The approach taken here is largely a computational one, since knowledge management is generally discussed, though not necessarily in the context of computer-based systems. Given a computerized knowledge management system, questions also arise of eliciting the knowledge to be embedded in the system; some of these are also addressed here.

BACKGROUND

Attempting to understand the nature of knowledge has been a major theme of philosophical enquiry for thousands of years. Thus, Aristotle (384-322 BC) argued that knowledge objects are made accessible to thought by assigning them to categories. This approach still underlies much of knowledge management in specific areas. It applies especially to library classification systems—for example, The Dewey Decimal Classification (Dewey et al., 2003) for organizing all published knowledge. The classic Yahoo search engine was based on the same principle.

However, not all knowledge management relates to knowledge by content area; many other classifications are possible, and it is the purpose of this article to elaborate those. Because of the multidimensionality of knowledge, many taxonomies are possible. A well-known attempt to survey taxonomies of knowledge in the context of knowledge management systems is that of Alavi and Leidner (2001); they present 10 categories of knowledge gleaned from the knowledge management literature; their summary is cited as Table 1. This article uses the Alavi and Leidner (2001) categories as a basis, while extending and rationalizing them.

In general, taxonomies of knowledge may be ordered by their degree of generality; one may deal with knowledge at the highest level of abstraction, as Sowa (2000) does, while at the other extreme there are taxonomies of knowledge within specific fields (i.e., subsets of the general scheme of clas-

sification by content). The approach taken here is something of an amalgam of these two extremes. As it is impossible within the confines of an encyclopedia article to cover the entire gamut of types of knowledge, the emphasis here is on some higher level categories that we consider most relevant to practical knowledge management.

THE FOCUS: DIMENSIONS OF KNOWLEDGE

In discussing types of knowledge, one can think of the characteristics of knowledge items as unique points, each representing a class of knowledge. In this approach, for example, tacit and explicit knowledge are two different types. Most taxonomies to date have adopted this view. However, these two categories are also opposite poles of a single dimension along which there may well be types of knowledge that are combinations of the extreme points: for example, a given item of knowledge may be partly tacit and partly explicit. It therefore seems useful to think of the dimensions as having two extremes and to juxtapose those to depict characteristics of any given knowledge object.

The dimensions of knowledge discussed here are the tacit-explicit, individual-social, procedural-declarative, commonsense-expert, and task-contextual; three additional dimensions—true-false, certain-uncertain, and private-public are also briefly introduced. As the reader will note, there is considerable, but not complete, overlap with the Alavi and Leidner (2001) typology. The dimensions are also consistent with, but broader than, Nichols' (2000) identification of tacit, explicit, declarative, and procedural knowledge.

Given the multidimensional nature of knowledge, the ontology of an item of knowledge must refer to its location on all relevant dimensions in order to provide a complete specification. Such a specification should provide guidance in building systems to manage knowledge.

Related Content

Using Agent Technology for Company Knowledge Management

Victoria Yoon, Barbara Broome, Rahul Singhand Tor Guimaraes (2008). *Knowledge Management: Concepts, Methodologies, Tools, and Applications (pp. 1789-1806).*

www.irma-international.org/chapter/using-agent-technology-company-knowledge/25221

External Knowledge Integration

Jeroen Kraaijenbrinkand Fons Wijnhoven (2011). *Encyclopedia of Knowledge Management, Second Edition (pp. 308-319).*

www.irma-international.org/chapter/external-knowledge-integration/48981

Epistemetrics: How We Measure

Eliezer Geisler (2008). *Knowledge and Knowledge Systems: Learning from the Wonders of the Mind (pp. 205-215).*

www.irma-international.org/chapter/epistemetrics-measure/24877

The Role of Knowledge Management Processes in ERP Implementation Success

Saeed Rouhani, Somayeh Hosseiniand Mehdi Shami Zanjani (2017). *International Journal of Knowledge-Based Organizations (pp. 15-26).*

www.irma-international.org/article/the-role-of-knowledge-management-processes-in-erp-implementation-success/182274

Use and Methods of Social Network Analysis in Knowledge Management

Tobias Muller-Prothmann (2008). *Knowledge Management: Concepts, Methodologies, Tools, and Applications (pp. 1096-1106).*

www.irma-international.org/chapter/use-methods-social-network-analysis/25162