

A Philosophical Perspective on Knowledge Creation

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INTRODUCTION

Today's economy is increasingly based on knowledge and information (Davenport, & Grover 2001). Knowledge is now recognized as the driver of productivity and economic growth, leading to a new focus on the role of information, technology and learning in economic performance. Organizations trying to survive and prosper in such an economy are turning their focus to strategies, processes tools and technologies that can facilitate them to create knowledge. A vital and well respected technique in knowledge creation is data mining which enables critical knowledge to be gained from the analysis of large amounts of data and information. Traditional data mining and the KDD process (knowledge discovery in data bases) tends to view the knowledge product as a homogeneous product. Knowledge however, is a multifaceted construct, drawing upon various philosophical perspectives including Lockean/Leibnitzian and Hegelian/Kantian, exhibiting subjective and objective aspects as well as having tacit and explicit forms (Nonaka, 1994; Alavi & Leidner, 2001; Schultze & Leidner, 2002; Wickramasinghe et al, 2003). It is the thesis of this discussion that by taking a broader perspective of the resultant knowledge product from the KDD process; namely by incorporating both a people-based perspective and process-based perspective into the traditional KDD process, it will not only provide a more complete and macro perspective on knowledge creation but also a more balanced approach to knowledge creation which will in turn serve to enhance the extant knowledge base of an organization and facilitate the realization of superior decision making. The implications for data mining are clearly far reaching and are certain to help organizations more effectively realize the full potential of their knowledge assets, improve the likelihood of using/re-using the

created knowledge and thereby enable them to be well positioned in today's knowledge economy.

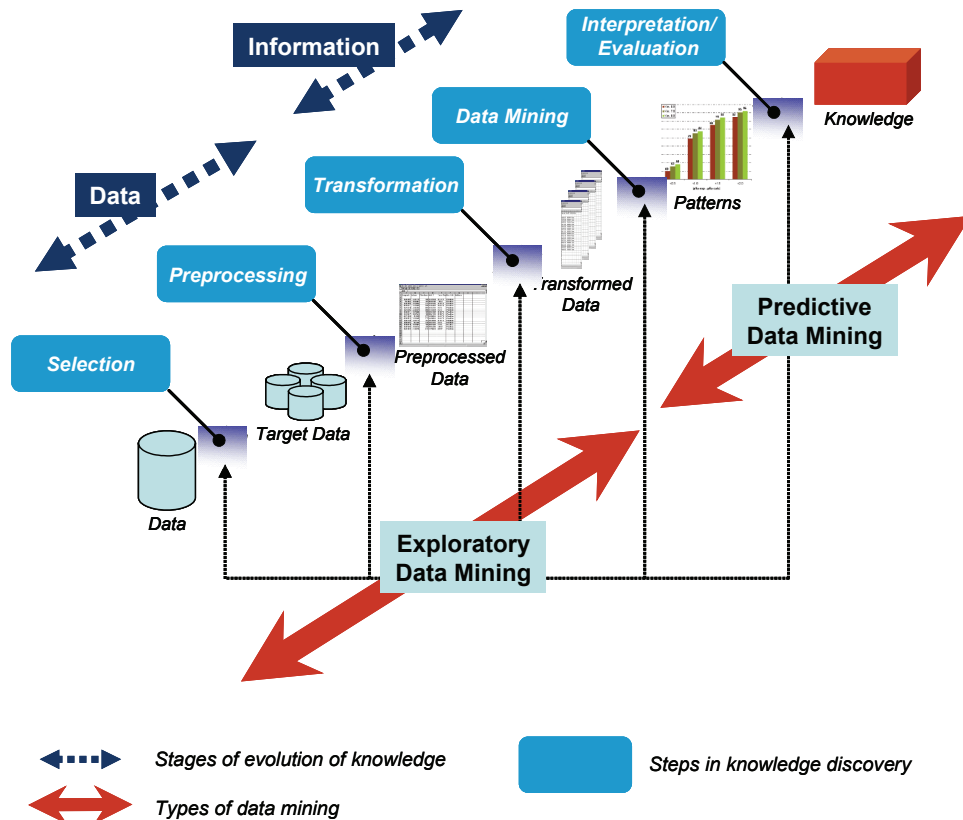
BACKGROUND: KNOWLEDGE CREATION

Knowledge Creation through Data Mining and the KDD Process

Knowledge discovery in databases (KDD), (and more specifically data mining) approaches knowledge creation from a primarily technology driven perspective. In particular, the KDD process focuses on how data is transformed into knowledge by identifying valid, novel, potentially useful, and ultimately understandable patterns in data (Spiegler, 2003; Fayyad et al., 1996). KDD is primarily used on data sets for creating knowledge through model building, or by finding patterns and relationships in data.

From an application perspective, data mining and KDD are often used interchangeably. Figure 1 presents a generic representation of a typical knowledge discovery process. This figure not only depicts each stage within the KDD process but also highlights the evolution of knowledge from data through information in this process as well as the two major types of data mining; namely, exploratory and predictive. whereas the last two steps (i.e., data mining and interpretation/evaluation) in the KDD process are considered predictive data mining. It is important to note in figure 1 that typically in the KDD process the knowledge component itself is treated as a homogeneous block. Given the well established multifaceted nature of the knowledge construct (Boland & Tenkasi, 1995; Malhotra, 2000; Alavi & Leidner, 2001; Schultze & Leidner, 2002; Wickramasinghe et al.,

Figure 1. Integrated view of the Knowledge Discovery Process (Adapted from Wickramasinghe et al, 2003)



2003) this would appear to be a significant limitation or over simplification of knowledge creation through data mining as a technique and the KDD process in general.

The Psycho-Social Driven Perspective to Knowledge Creation

Knowledge can exist as an object, in essentially two forms; explicit or factual knowledge and tacit or experiential i.e., "know how" (Polyani, 1958; 1966). Of equal significance is the fact that organizational knowledge is not static; rather it changes and evolves during the life time of an organization (Becerra-Fernandez, 2001; Bendoly, 2003; Choi & Lee, 2003). Furthermore, it is possible to change the form of knowledge; i.e., transform existing tacit knowledge into new explicit knowledge and existing explicit knowledge into new tacit knowledge or to transform the subjective form of knowledge into the objective form of knowledge (Nonaka & Nishiguchi, 2001; Nonaka, 1994). This process of transforming the form of knowledge, and

thus increasing the extant knowledge base as well as the amount and utilization of the knowledge within the organization, is known as the knowledge spiral (Nonaka & Nishiguchi, 2001). In each of these instances the overall extant knowledge base of the organization grows to a new, superior knowledge base.

According to Nonaka (Nonaka & Nishiguchi, 2001):

- 1) Tacit to tacit knowledge transformation usually occurs through apprenticeship type relations where the teacher or master passes on the skill to the apprentice.
- 2) Explicit to explicit knowledge transformation usually occurs via formal learning of facts.
- 3) Tacit to explicit knowledge transformation usually occurs when there is an articulation of nuances; for example, as in health-care if a renowned surgeon is questioned as to why he does a particular procedure in a certain manner, by his articulation of the steps the tacit knowledge becomes explicit and
- 4) Explicit to tacit knowledge transformation usually occurs as new explicit knowledge is internalized it can then be used to broaden, reframe and extend one's tacit knowledge. These transformations are often referred to as the modes of socializa-

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