Chapter XIV
The Evolution from Data to Wisdom in Decision–Making at the Level of Real and Virtual Networks

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ABSTRACT

This chapter provides theoretical analysis and synthesis of how computer applications are applied in problem-solving and decision-making in practice of real and virtual networks. The defined semantic ladder of cognition units provides the background for the analysis of the evolution of Knowledge Management technology and its applications in problem-solving and decision-making processes. The defined categories of decision-making tasks allow for the categorization of activities in network-oriented collaboration and the review of knowledge technology application in their implementations. Based upon this approach, the review of Knowledge Management technology is synthesized in real and virtual networks. Eventually both kinds of networks are compared by the Knowledge Management application criterion. However, Knowledge Management technology, despite its growing popularity is not the ultimate application, since wisdom not knowledge is the ultimate unit of cognition. Its structure in the civilization context is synthesized. Conclusions for theoreticians and practitioners are offered.

INTRODUCTION

The purpose of this chapter is to provide the theoretical background for the computer-driven applications in problem-solving and decision-making in practice of real and virtual networks. The main premises of this study are as follows:

1. So far Knowledge Management systems (KMS) were limited to data and information processing, but with the dawn of data mining, they should be very useful in elaborating *rules* of *knowledge* of a given business or organizational unit, which should enhance problem solving and decision-making in practice.

2. The KMS can be useful but is not the ultimate feature in problem-solving and decision-making, since the ultimate factor is wisdom, which is very difficult to automate. Hence the wisdom-oriented approach towards problem solving and decision-making is defined in this chapter.

3. The evolution approach towards *knowledge* and *wisdom* applications in problem-solving and decision-making is applied in this study in order to understand stages (and their possible success/failure factors) of information technology applications in applying these units of cognition.

The decision-making process is predominantly a cognition-oriented process. Cognition as a process is mostly associated with thinking, which processes information either stored in human memory or just fed into it from external sources. The "source material" in cognition-oriented processes is *information*. However nowadays, information can be treated as a colloquial term, which must be decomposed into more elementary, quanta kind of units, which will be called cognition units, such as; data, information, concept, knowledge, and wisdom. They convey the essence of thinking and decision-making under the form of message semantics. Of course there is a question of how do they sent it through several gates of mind, and external channels of communication. This flow reflects the syntax aspect of cognition units processing and handling. In this study this aspect is limited to networks, either real or virtual. Another aspect of messaging in decision-making is the pragmatic aspect of cognition which deals

Figure 1. The cross-sections of knowledge management systems
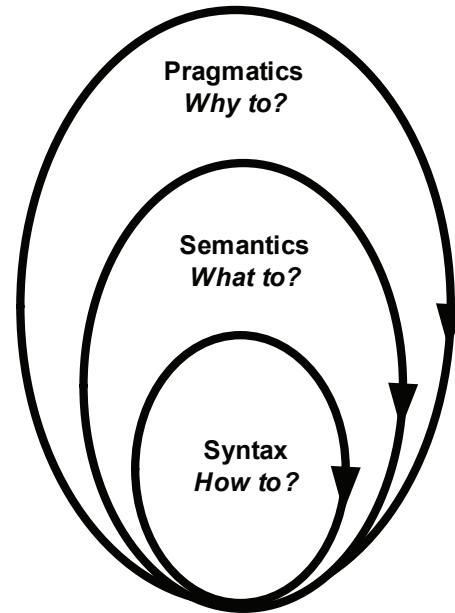
with the question: Why is a decision made? This aspect is not considered in this study. These three cross-sections of cognition are treated under the framework of Knowledge Management systems as shown in Figure 1.

Knowledge management systems' technological tools are closely related to information technology as well as to organizational learning initiatives. Knowledge management may be distinguished from organizational learning by its greater focus on the management of specific knowledge assets and development and cultivation of the channels through which knowledge flows for the purpose of decision-making, supported by information technology.

This study will look how cognition units can be applied in the problem-solving/decision-making processes in order to make these processes more information-concept-knowledge intensive. The evolution of KMS will provide some sugges-

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