CONCEPTUAL MODELS FOR INFORMATION AND KNOWLEDGE

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Abstract. *The paper aims to clarify some contradictory aspects that appear in studies on Information Science, proposing their approach with the new concept of the General Theory of Information (GTI). The main achievement of this theory is to provide a comprehensive and relevant definition of information, to whom in the present work is added an analysis of the direct relationship is established between information and knowledge. Starting from axiological and ontological principles proposed by the initiator of GTI, Mark Burgin, various theoretical approaches are analyzed, looking for common elements and unifying instances and how to evaluate their properties through adequate information measures. As a conclusion, it is argued that many other known directions of information theory may be treated inside GTI as its particular cases.*

Key words: information theory, informational system, information measures, knowledge meanings, information meanings

1. Introduction

In order to create a framework to study the conceptual models of information, it is mandatory to answer to two main problems related to it. The first one is to define what information is and to find what basic properties it has. The second problem is how to measure and evaluate information. From the beginning of the development of information theory, it was known more how to measure information than what information is. Hartley and Shannon gave effective formulas for measuring the quantity of information.

However, without understanding the phenomenon of information, these formulas bring misleading results when applied to irrelevant domains. At the same time, a variety of information definitions have been introduced. Scientists created a diversity of information theories: statistical (Shannon's theory of communication), semantic, algorithmic, qualitative, dynamic and so on. Naturally some of them have tried unification of these approaches into a general theory of information (GTI).

One of the first proposals was advanced by Burgin [1]. Burgin's GTI is built as a system of ontological and axiological principles that represent intrinsic properties of information and information processes. They reflect the most essential properties of information as a natural, social, and technological phenomenon as well as regularities of information functioning.

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