

Methodological Deficiencies in Knowledge Representation Conceptual Theories of Artificial Intelligence

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Abstract : Current problematic issues in AI fields are mainly due to those of knowledge representation conceptual theories, which in turn reflected on the entire scope of cognitive sciences. Knowledge representation methods and tools are driven from theoretical concepts regarding human scientific perception of the conception, nature, and process of knowledge acquisition, knowledge engineering and knowledge generation. And although, these theoretical conceptions were themselves driven from the study of the human knowledge representation process and related theories; some essential factors were overlooked or underestimated, thus causing critical methodological deficiencies in the conceptual theories of human knowledge and knowledge representation conceptions. The evaluation criteria of human cumulative knowledge from the perspectives of nature and theoretical aspects of knowledge representation conceptions are affected greatly by the very materialistic nature of cognitive sciences. This nature caused what we define as methodological deficiencies in the nature of theoretical aspects of knowledge representation concepts in AI. These methodological deficiencies are not confined to applications of knowledge representation theories throughout AI fields, but also exceeds to cover the scientific nature of cognitive sciences. The methodological deficiencies we investigated in our work are: - The Segregation between cognitive abilities in knowledge driven models.- Insufficiency of the two-value logic used to represent knowledge particularly on machine language level in relation to the problematic issues of semantics and meaning theories. - Deficient consideration of the parameters of (existence) and (time) in the structure of knowledge. The latter requires that we present a more detailed introduction of the manner in which the meanings of Existence and Time are to be considered in the structure of knowledge. This doesn't imply that it's easy to apply in structures of knowledge representation systems, but outlining a deficiency caused by the absence of such essential parameters, can be considered as an attempt to redefine knowledge representation conceptual approaches, or if proven impossible; constructs a perspective on the possibility of simulating human cognition on machines. Furthermore, a redirection of the aforementioned expressions is required in order to formulate the exact meaning under discussion. This redirection of meaning alters the role of Existence and time factors to the Frame Work Environment of knowledge structure; and therefore; knowledge representation conceptual theories. Findings of our work indicate the necessity to differentiate between two comparative concepts when addressing the relation between existence and time parameters, and between that of the structure of human knowledge. The topics presented throughout the paper can also be viewed as an evaluation criterion to determine AI's capability to achieve its ultimate objectives. Ultimately, we argue some of the implications of our findings that suggests that; although scientific progress may have not reached its peak, or that human scientific evolution has reached a point where it's not possible to discover evolutionary facts about the human Brain and detailed descriptions of how it represents knowledge, but it simply implies that; unless these methodological deficiencies are properly addressed; the future of AI's qualitative progress remains questionable.

Keywords : cognitive sciences, knowledge representation, ontological reasoning, temporal logic

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