Web Intelligence, Business Intelligence and Decision Support Systems: A Challenge for Fuzzy Logic and Soft Computing

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I. EXTENDED ABSTRACT

We present first some general remarks on challenges faced by modern information technology, notably when a human being is a relevant factor. These challenges are mainly related to inherent difficulties in solving some "meta-problems", in particular broadly perceived decision making. We assume, on the one hand, business intelligence related perspective, augmented with elements of Web intelligence, to fully use all available tools and resources. On the other hand, we assume a human centric computing perspective in the spirit of, for instance, Dertouzos's ideas.

First, we present a brief account of modern approaches to real world decision making, emphasize the concept of a decision making process that involves more factors and aspects like: the use of own and external knowledge, involvement of various „actors", aspects, etc., individual habitual domains, non-trivial rationality, different paradigms. As an example we mention Checkland's deliberative decision making (which is an important elements of his soft approach to systems analysis).

After an analysis of specifics and difficulties encountered in many real world decision-making situations, we strongly advocate the use of computer based decision support systems. First, we briefly review the history of decision support systems, and then present a popular classification, starting from data driven to Web based and inter-organizational. We indicate that decision support systems should incorporate some sort of "intelligence", and we first briefly mention some views of what intelligence may mean in this concept, and then assume some more pragmatic, though limited, view of intelligent decision support systems.

We indicate possible advantages of using elements of fuzzy logic and soft computing, notably, Zadeh's computing with words to be able to somehow merge the ideas presented like: human centric computing, decision making processes, intelligent decision support, etc.

Finally, we present an example of implementation in which the above-mentioned ideas have been to some extent implemented. This concern a data and document driven decision support system for a small to medium company in which, first, Zadeh's computing with words and perceptions paradigm is employed via linguistic database summaries, elements of Web intelligence are used to derive additional information, and the ideas of an intelligent decision support and human centric computing are shown to be synergistically combined.

We finish with some general remarks emphasizing that fuzzy logic and soft computing, notably as exemplified by Zadeh's computing with words and perceptions may be viewed as providing just the right tools to solve the problems considered.

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