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Knowledge criteria for the evaluation of legal beliefs

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1. INTRODUCTION

In this paper, we describe an evaluation framework for legal knowledge-based systems. The framework is based on knowledge criteria, drawn from the philosophical discipline called epistemology. Knowledge criteria serve to determine whether a belief is knowledge. To accommodate the different characteristics of legal knowledge, we distinguish three belief types, *viz.* perceptual basic beliefs, inferential basic beliefs, and interpretative beliefs. The knowledge criteria employed to turn these beliefs into knowledge are truth, narrow justification, reliability, consistency, and coherence. We show that beliefs, depending on the type they belong to, become knowledge by applying different subsets of these criteria. The main research question to be answered is: how can we use knowledge criteria to evaluate the task of a legal knowledge-based system?

The question what makes belief into knowledge often remains unanswered in the discussion of legal knowledge-based systems. Reichgelt states that the plain use of a knowledge-representation language does not imply that the information written down in that language qualifies as knowledge in a philosophical sense [7]. Thus, the fulfilment of knowledge criteria per se is not a prerequisite for knowledge representation, and from our viewpoint it should be called belief representation. We claim that, nevertheless, the question what makes belief into knowledge is relevant, because (1) legal knowledge-based systems contain represented legal beliefs, *i.e.*, they contain representations of beliefs about positive law, interpretations, systematisations, legally relevant facts and so forth, and (2) we want to be able to qualify these beliefs under certain conditions as knowledge, because mere beliefs do not have sufficient bearing on their object. To put it in other words: beliefs should reflect legal reality.

2. FIVE KNOWLEDGE CRITERIA

To become knowledge, a belief has to comply with a set of knowledge criteria; simply believing that something is the case does not make that belief into knowledge. When a belief fulfils the required criteria, it qualifies as knowledge. We distinguish five knowledge criteria: truth, narrow justification, reliability, consistency, and coherence. For instance, if we employ truth and narrow justification as knowledge criteria, a belief qualifies as knowledge if it is both true and narrowly justified.

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The first knowledge criterion is *truth*. The truth criterion adopted here is correspondence truth [1]. Correspondence truth amounts to the condition that, if the content of the belief means that a certain state of affairs exists, and the state of affairs does indeed exist, then the belief is true.

The second knowledge criterion is *narrow justification*. The application of the criterion of narrow justification to a belief amounts to giving sufficient reasons for that belief, and, if necessary, reasons for those reasons [6]. The term justification itself is reserved as a denominator for a set of knowledge criteria, including narrow justification. Between a reason and a belief, there is a *supportive relation*. This means that the reason sustains the belief.

The third criterion is *reliability*. According to Goldman, the justification of a belief depends on the reliability of the mechanism that forms it [3]. The human cognitive system, for instance, is such a mechanism. If the mechanism is reliable, and if it thus tends to yield correct beliefs, the resulting beliefs are justified.

The fourth criterion is *consistency*. This is a logical criterion. It says that two beliefs may not logically exclude each other.

Coherence is the fifth knowledge criterion. It is a measure for the degree to which a belief is linked to and in accordance with other beliefs. Coherence often implies consistency, but in this paper, we separate the two criteria. In addition, coherence includes logical (deductive or inductive) implication relations between other beliefs and the belief evaluated [4].

Knowledge criteria apply to beliefs. Instead of discerning just one type of belief, we distinguish three types of legal beliefs. The first type consists of *perceptual basic beliefs*. These beliefs are formed because of a perceptual experience we have. For instance, Bettie sees President Clinton walking by, and therefore she believes that President Clinton is walking by. The second type consists of *inferential basic beliefs*. These are beliefs that are inferred from indirect perceptual evidence. In a newspaper, Monica reads that President Clinton visited The Netherlands. Therefore she believes that President Clinton visited The Netherlands. The third type consists of *interpretative beliefs*. These beliefs are interpretations of evidence. For instance, Newt sees President Clinton patting on the shoulder of an accompanying young woman, and therefore Newt believes that Clinton has some kind of affectionate relation with her.

Different sets of knowledge criteria apply to these three belief types. First, we assume the following four criteria to be necessary to turn perceptual basic beliefs into knowledge: truth, narrow justification, reliability, and consistency. Gettier pointed out that justified true belief is not necessarily knowledge [2], and Goldman introduced the criterion of reliability as a solution to

that problem [3]. But reliability on itself does not make a belief into knowledge. Therefore, the criteria are combined. Moreover, consistency is added. Inconsistency of perceptual basic beliefs would mean there is an inconsistency in reality, and this possibility is rejected for the 'physical' part of the world (not, beforehand, for institutional reality).

Second, inferential basic beliefs become knowledge if they comply with the criteria of truth, narrow justification, and consistency. Inferential basic beliefs are only indirectly formed by the belief-producing perceptual mechanism; they are mainly influenced by the inference made. The inference applied makes the belief into an inferential basic belief. The reliability of the 'inference engine' should be assessed to apply the criterion of reliability to inferential basic beliefs. Though this may be possible, we refrain from such an attempt, and we will therefore not adopt the criterion.

Third, for interpretative beliefs, we need narrow justification and coherence. It is seldom possible to apply the truth criterion to interpretative beliefs, as interpretations do not *correspond* to states of affairs in reality. Instead, they sometimes *establish* states of affairs in reality. For instance, in case a judge forms an interpretative belief in the Lewinsky case, and his judgement is that Clinton is guilty of committing perjury, he establishes an institutional fact. True statements can be made about such facts. The coherence criterion imposes constraints on relations among beliefs. It replaces the external criterion of correspondence. Coherence itself only concerns relations among beliefs, not their relation with reality.

3. ASSESSMENT OF LEGAL KNOWLEDGE-BASED SYSTEMS

Knowledge-based systems are used for retrieval purposes, automatic inferences, decision support, *etcetera*. A possible way to evaluate the contents of the systems is to take a closer look at the nature of beliefs incorporated in the systems and the nature of beliefs held by the users of the systems. Saying that a system incorporates a belief means that it contains a proposition reflecting some part of legal reality, or an interpretation or systematisation of some part of legal reality.

We distinguish two categories of systems. The first category makes decisions with the help of information supplied by the builders and the users, the second category helps the users to make a decision by supplying information. ESM [8] is a system of the former category. IvS [5] is a system of the latter category.

The primary goal of ESM is to provide the user with a reconstruction of the decision process underlying the issuing of permits in environmental law. The user asks the system to provide a conclusion, given a set of data, and (s)he can ask the system to justify that conclusion by showing the underlying rules and facts. If alternative conclusions are possible, these are shown by the system [8].

IvS supports judges in determining sentences. The goal of IvS is to make transparent the current sentencing practice in order to help the judges determine a sentence in an individual case. As a direct consequence, the system is meant to reduce dissimilarities in sentences when similar circumstances apply. It thus tends to improve equality of rights [5].

The content of legal knowledge-based systems can be evaluated in terms of the beliefs they contain. Both IvS and ESM contain inferential basic beliefs: the beliefs they contain are based on the

beliefs of their builders and their users. Both systems fulfil certain knowledge criteria with respect to either these beliefs or beliefs held by users. For instance, IvS increases the narrow justification of a belief held by its user, and ESM increases the coherence of a belief present in the system. Other knowledge criteria (truth, reliability, consistency) can be influenced by the employment of a knowledge-based system as well.

4. CONCLUSIONS

Three conclusions are drawn. First, the belief evaluation of a knowledge-based system does not make sense without taking into account the role of its user. Only when we know what type(s) of belief the system contains and the type(s) of belief the user holds, we can properly evaluate which knowledge criteria apply.

Second, legal knowledge-based systems are mainly concerned with interpretative beliefs: complex legal problems involve interpretation. However, they contain only inferential basic beliefs, provided to them by their builders and users. These inferential basic beliefs are subject to other knowledge criteria. Consequently, the system has to use other procedures and techniques to make these beliefs into knowledge (if required).

Third, reasoning with interpretative beliefs yields a problem. As truth is not a criterion which we can apply to these beliefs, making valid deductive inferences with interpretative beliefs as premises is still possible, but it becomes a rather questionable enterprise.

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