

Knowledge Based System Explanation: The Ripple Down Rules Alternative

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Abstract: The ability to provide explanations has been seen as a key feature of Expert Systems (ES) typically not offered by other types of computer systems. ES need to offer explanations because of imprecise domains and the use of heuristics. Verification is not enough. ES need to justify and be accountable. Explanation is seen as an important activity for Knowledge Based Systems as it satisfies the user's need to decide whether to accept or reject a recommendation. In this paper we briefly review explanation in first generation and second generation ES. An alternative is offered to the mainstream approaches which uses a knowledge acquisition and representation technique known as Multiple Classification Ripple-Down Rules and challenges even the goals of explanation. Instead of trying to give explanations which provide a meaningful line of reasoning and which are tailored to suit the individual it may be just as useful to provide the user with sufficient information and browsing tools to develop their own line of reasoning. The type of information that can assist understanding is the context in which the recommendation applies (which is provided through the display of relevant cases and exception rule history) and the ability to explore an abstraction hierarchy of the rules using Formal Concept Analysis. An explanation toolkit aimed at putting the user in control is described and evaluated in this paper.

Keywords: Knowledge based systems, ripple down rules, explanation, formal concept analysis.