Reviewer's report

Title: A study of diverse clinical decision support rule authoring environments and requirements for integration

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Reviewer: David Isern

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Rule authoring systems are a type of DSS quite popular in the 90’s. In my opinion, these Systems have been embedded by clinical guideline-based Systems due to the time consuming task of maintenance and interoperability. As authors of the paper noticed at the end of the paper, most of the RAE systems analysed lack of openness and standardization.

Major compulsory revisions

My major doubt is about the bias of the study. On page 16, the authors summarise the list of limitations of the study, which are quite restrictive. Usually, these tools are localized in a healthcare organization without connection with other information systems and without interfaces to exchange information between them. This is a traditional drawback on computer science where providers of software usually create ad hoc tools/solutions according to the on-site conditions. Change this situation is a challenging task that begins with the creation of open protocols and tools to use them. This discussion should be improved in the paper.

Isern and Moreno [1] analysed the use of clinical guidelines in healthcare from different perspectives. Several points are the same such as the analysis of the knowledge representation, the necessity of accurate interfaces, and the adoption of widely-used terminologies. Following the conclusions of this study, one of the most important requirements is the connection of these tools (patient-centred) with electronic health records. I recommend discuss this issue separately using information provided in Table 1. For instance, the 2nd edition of Reminder, Nephros, Gerios, and MRE offer this facility. Another perspective that has not been addressed is the analysis of the kernel of these systems: the rules. It could be interesting to know the level of expressivity on each case, analyse common and distinct actions, and devise the possibility to adopt a standard in a near future.

Minor essential revisions

Introduction could be improved with the discussion of recent works as [2] and [3]. The first one performs a deep study of the development of a rule-based system. Particularly interesting is the analysis with clinical guidelines. The second work analyses the rules from a qualitative perspective. This is an interesting issue: how good and reliable are rules? Validation measures should be included during the creation of rules in order to assure a level of quality and avoid ambiguities.
Additionally, Shiffman et al. [4] proposes a methodology to acquire and represent medical knowledge in clinical guidelines. These general patterns could be used to improve authoring rules.

Discretionary revisions
It could be interesting to provide more details about the analysed tools, more statistical information as well as screenshots. I assume that it depends on the copyrights.


**Level of interest:** An article of limited interest

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests