Reviewer's report

Title: Challenges and Requirements for Guidelines Systems

Version: 1 Date: 21 August 2011

Reviewer: David Isern

Reviewer's report:

The background section depicts the goal of this review: “to collect a comprehensive set of requirements that we (the authors) believe are essential or desirable in a computer-executable guideline system for a CDSS”.

To achieve this goal, the authors have analyzed the current use of clinical guidelines (CG, from now on) in healthcare and they identified 7 different topics (e.g., knowledge representation, editability, reusability, etc.), which are described through the paper.

The paper is well-structured and easy to read, however there are deficiencies that should be fixed before accepting it.

Major compulsory revisions

As said before, the first section of the paper describes the goal of the paper and, at the same time, says that most of the papers analyzed biases the requirements within the system/model proposed without a high-level perspective. In the opinion of the reviewer, this assumption is not correct and the rest of the paper is affected by this fault.

There are several papers and reviews in the area that analyze, compare, discuss and propose requirements for guideline-based decision support systems that should be considered in further releases of this paper. In the following, some of them are summarized. In [1] and [2], the authors identify some of the requirements depicted by the authors of the paper such as editability, execution, and standards and integration. In [3], the authors analyze the current use of GLs in CDSSs and how GLs could be customized taking into account the daily use of them. In [4], the authors analyze the adherence to recommendations made by CGs. In [5], the authors propose the personalization of general CGs before applying it to patients. In this sense, they propose a methodology to create a new CG from the adaptation of existing ones. In [6], the authors analyze current languages to represent CGs and propose a method to compare them. In [7], the authors analyze the benefits, drawbacks, and scope of available CGs in the pediatrics domain.

As a general comment through the whole paper, some assumptions and conclusions are not justified with references and arguments. In addition, the methods section should be improved giving more details about the databases used to collect papers, the coverage of the review, the criteria used during the search, papers considered, keywords used, topics discarded, etc.
Some of the set of requirements identified are not novel and some of them are widely used in existing computer-based guideline systems such as Arezzo [8], SAGE [9], and DeGeL [10, 11]. It could be useful to the authors to read those papers before assuming erroneous conclusions.

The authors propose the use of existing workflow-based suites to extend the use of CGs by other healthcare systems such as EMRs or CPOEs. This is an interesting idea for further systems but the authors do not discuss/analyze why current systems cannot be embedded into healthcare systems. For instance, some of these mentioned systems permit interaction with external elements by implementing interfaces described in a well-formed standard language as XML.

On pages 17-19, the authors discuss about the inference abilities required in a CG-based system. The authors describe with an example that rule-based inference system are not able to interpret rules that include sonographic images (interpretable resources). Some recent works try to avoid this limitation including an intermediate layer between the CG and the clinician, such as an ontology. For instance, in [12] an ontology permits to map the results of a test (e.g. sonography) as interpretable attributes in a CG. In the same section, the authors explain that that those systems should be able to “explain” the actions taken. Well, the authors can find some works about argumentation used in healthcare domain such as [13] and [14] that can solve their questions in this topic.

On pages 19-20, the authors distinguish three different modes of execution of CGs. These three modes are quite subjective and can be fused in two modes: simulated and online. The first one can be used to test the performance and behavior of CGs using an interface and testing data, meanwhile the second mode uses real data and it is used on real time. The coverage of a CG (patients over a CG is enacted) can be one or more than one. This is the mode of operation on most of the existing guideline-based systems. Then, the proposed modes of operation should be explained and justified better with examples.

On page 20, performance efficiency and scalability are two different topics. The authors discuss about the efficiency of execution of a CG but not on the scalability of a CG-based system.

On page 21, the section implications of longer duration execution is irrelevant because the persistence of data is a mandatory requirement independently on the duration of the execution.

References on CGs (theory and benefits) should be revised and improved drastically. For instance, recent works as [7], [15], and [16] permits to analyze the current use of CGs in daily care, identifying advantages, drawbacks and barriers that should be solved in the future.

-----


2. Fox J, Glasspool D, Patkar V, Austin M, Black L, South M, Robertson D, Vincent C: Delivering clinical decision support services: There is nothing as

3. Fox J, Patkar V, Chronakis I, Begent R: From practice guidelines to clinical

4. Oh SW, Lee HJ, Chin HJ, Hwang JI: Adherence to clinical practice guidelines


computer-interpretable guideline modeling languages. Artif Intell Med 2011,

F: Clinical practice guidelines: What they are, why we need them and how they
should be developed through rigorous evaluation. Eur J Pediatr 2011,
170(7):831-836.

8. Sutton DR, Fox J: The syntax and semantics of the PROforma guideline

9. Tu SW, Campbell JR, Glasgow J, Nyman MA, McClure R, McClay J, Parker C,

MK, Gutnik L, Lunenfeld E: Ability of expert physicians to structure clinical

11. Moskovitch R, Shahar Y: Vaidurya: A multiple-ontology, concept-based,
context-sensitive clinical-guideline search engine J Biomed Inform 2009,
42(1):11-21.

12. Isern D, Sánchez D, Moreno A: Ontology-driven execution of clinical

13. Tolchinsky P, Cortés U, Grecu D: Argumentation-Based Agents to Increase
Edited by Annicchiarico R, Cortés U, Urdiales C. Basel, Switzerland: Birkhäuser
Verlag; 2008: 65-94.

14. Fox J, Glasspool D, Grecu D, Modgil S, South M, Patkar V:
Argumentation-Based Inference and Decision Making - A Medical Perspective.

15. Haynes RB, Wilczynski NL: Effects of computerized clinical decision support
systems on practitioner performance and patient outcomes: Methods of a
decision-maker researcher partnership systematic review Implementation
Science 2010, 5:12-34.

IM, Peek N: The effect of computerized decision support on barriers to guideline
implementation: A qualitative study in outpatient cardiac rehabilitation. Int J Med
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