Reviewer's report

Title: A context model to prioritize drug safety alerts in CPOE systems: Development and first validation

Version: 2 Date: 10 March 2011

Reviewer: Bruce Chaffee

Reviewer's report:

1. Is the question posed by the authors well defined?
   C1. The question is simple and straightforward.

2. Are the methods appropriate and well described?

   Discretionary Revisions
   C2. Page 4, Methods, Literature Search. It is unclear how the 10 major ‘magazines’ were chosen, but a significant amount of CPOE-related work has been conducted in other journals as well, particularly in the pharmacy literature. A journal such as the American Journal of Health-Systems Pharmacy should have been had searched as well, although hopefully relevant articles were discovered via the PubMed search.
   C3. A search using “warning” might have yielded a few more articles.

   Major Compulsory Revisions
   C4. Figure 3 is not clear. If you add up all the N= for each tow it does not add up to the N= on the flow chart (e.g. Hand search = 61, Specific PubMed search = 174, Topical PubMed search = 10 totals 245 not 224). This is true for each row/line of the chart. I presume that is because there is overlap, but this fact should be foot noted where relevant.
   C5. It is not clear how the main axes of Patient/Case, Alert, and Organizational unit were derived. If this is subjective based on author opinion, it should be stated. If it were derived from interviews, then that should be stated. If there is a reference, it should be cited. In personally reviewing the contexts, I would submit that there should be another axis for “individual clinician”. Under this, the following contexts would have been placed “professional experience of the user, current task of the user, personal preferences of the user, specialty, and workload”. I would submit that repetition of alerts and override rate of alerts fall under the “alert” axis. This highlights the need for external validation of the model.
   C6. The phase 2 inductive category development steps should be outlined in a figure so that the methodology is clear. How were the context factors hierarchically organized? Who participated on the inductive category development and how (simply referencing an abstract of the process is insufficient)? How was MindMeister used and who participated in it?
3. Are the data sound?
C7. It is structured, but it is difficult to determine if it is sound due to the methodology issues listed above. It will be easier to assess once these have been addressed.

4. Does the manuscript adhere to the relevant standards for reporting and data deposition?
C8. Yes.

5. Are the discussion and conclusions well balanced and adequately supported by the data?
C9. Yes, pending elaboration/response to the identified methodology issues.

6. Are limitations of the work clearly stated?
C10. Yes.

7. Do the authors clearly acknowledge any work upon which they are building, both published and unpublished?
C11. Yes.

8. Do the title and abstract accurately convey what has been found?
Major Compulsory Revisions
C12. I don’t believe the entirety of the title is appropriate. The model was created based on a combination of literature research and “expert” interview with internal validation as described by inter-rater reliability testing. Using ‘validation’ in the title might mislead the reader to think that external validation was performed. The title should simply state “Development of a context model for drug safety alerts in CPOE systems”. The authors discuss these same limitations on page 10.

9. Is the writing acceptable?
Discretionary Revisions
C13. Abstract, page I. “Unfortunately, they tend to produce a large number of unspecific alerts, ….”. The term ‘unspecific’ is debatable as many are very specific – certainly they can be highly dependent on the 20 context factors the authors derived from their work.
C14. Background, page 1 first sentence. I’ve seen this quote attributed to St. Augustine and Seneca the Younger. It might be worthwhile referencing the source of the author’s attribution.
C15. Page 4, Methods, Literature search. The word “journal” is preferred over “magazine”.
C16. With respect to the unanswered questions, I would recommend you include pharmacist informatics experts and perhaps other published ordering clinicians with expertise in your panels. Each brings a different perspective but all have substantial contributions to the concepts you are researching.
C17. I would suggest you pursue external validation and determine if there are more than 20 context factors in your future work.

Minor Essential Revisions

C18. Background, page 1, second sentence. The sentence should be revised. Using “early on” at the conclusion of the sentence is improper grammar. Perhaps an approximate date range could be used, especially since a reference is cited.

C19. Background, page 1, second section “CPOE to prevent medication errors and ADEs”. Both of the first two sentences discuss medication errors and the references all relate, so these should be merged. If the point is to highlight ADE, the thought wording should be changed for the second sentence to reflect only ADE, not both.

C20. Page 2, paragraph 2, sentence 4 beginning with “Alert fatigue …”. I would disagree that it is “best” described as written by the authors. There are other descriptions and this one has not been proven to be the best one.

C21. On page 3, the authors cite the use of 5 international experts in the field of CPOE. This sentence to me is an unnecessary rationalization for performing the work they have done. The experts aren’t named, it isn’t clear how the study concept was presented to them, and their individual opinions of the concept are not presented. I suggest removing the sentence.


C23. Page 5 under “Expert interviews”. Third sentence "indented" should be “intended”. Please clarify what is meant by “saturation”. How many interviews were intended, how many were ultimately done (the total number performed is found in the discussion and description of Table 4, not in the methodology text), and how was the decision made to stop with five?

C24. Table 4 under the “Alert” axis “Current task of the user” is listed, but it is listed under the “organizational unit” axis on the prior tables. Please revise.

C25. Page 9 discussion paragraph 1. The last sentence beginning with ‘Finally, three out of …” can be consolidated with the preceding sentence.

C26. Page 11, sentence beginning with “A shared international database ..”. I would suggest softening this statement substantially. We are a long ways away from having an international database that could be considered universally acceptable for a variety of fair trade and usability reasons. Reference databases differ substantially from each other in content and differ in how they interface with CPOE systems. Vendor CPOE systems all differ in the user interface, functionality/workflow, and design capabilities.

Level of interest: An article of importance in its field

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