Author’s response to reviews

Title: CDAPubMed: a browser extension to retrieve EHR-based biomedical literature

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Version: 3 Date: 14 December 2011

Author’s response to reviews: see over
Author’s response to reviews

Title: CDAPubmed: a browser extension to retrieve EHR-based biomedical literature

Authors: David Perez-Rey, Ana Jimenez-Castellanos, Miguel Garcia-Remesal, Jose Crespo and Victor Maojo

Version: 3

Date: 12th December 2011

Author’s response to reviews: see over
Dear Editor,

We are submitting a second revised version of our manuscript entitled “CDAPubmed: a browser extension to retrieve EHR-based biomedical literature” to be considered for a “software” publication at BMC Medical Informatics & Decision Making.

We would like to thank the referees for their valuable comments regarding our work. We have followed their recommendations and included a further evaluation of our software. We hope that our paper will be now suitable for publication in BMC Medical Informatics and Decision Making. Changes have been highlighted in red to facilitate this review.

While two of the three reviewers have accepted the current version of the paper, the third reviewer’s main requirement was further evaluation. To address the reviewer’s concerns, we have carried out an online user satisfaction survey of CDAPubMed. Five external experts from Institute Jules Bordet, the Breast International Group, Philips Research and Universidade da Coruña, have provided valuable feedback that we believe shows the suitability of our implementation. We would also like to specially thank the third reviewer for the valuable feedback provided by thoroughly testing CDAPubMed.

Regarding quality of written English, our English editor will review the last version of the manuscript again before the publication.

Below, we present a point-by-point description of the changes made following the reviewers suggestions.
Reviewer's report

Title: CDAPubMed: a browser extension to retrieve EHR-based biomedical literature

Version: 2 Date: 8 October 2011

Reviewer: Illhoi Yoo

Reviewer's report:

Accepted!

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
Reviewer's report

Title: CDAPubMed: a browser extension to retrieve EHR-based biomedical literature

Version: 2 Date: 14 October 2011

Reviewer: Zhiyong Lu

Reviewer's report:

The quality of the manuscript is much improved in this revised version. I am satisfied with the changes the authors made with regard to my previous comments.

Minor Essential Revisions

1. Please include a link in the paper for your software.

   Included at the end of the Background section

2. Give the name of the branches in Table 1. Single letters are not enough.

   Done

Level of interest: An article of importance in its field

Quality of written English: Needs some language corrections before being published

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
Reviewer's report

Title: CDAPubMed: a browser extension to retrieve EHR-based biomedical literature

Version: 2 Date: 19 October 2011

Reviewer: Aurelie Neveol

Reviewer's report:

CDAPubmed: a browser extension to retrieve EHR-based biomedical literature

David Perez-Rey, Ana Jimenez-Castellanos, Miguel Garcia-Remesal, Jose Crespo and Victor Maojo

BMC Medical Informatics and Decision Making Software

This paper presents a software tool that facilitates PubMed searches launched directly from EHRs in HL7-CDA format. Overall, this is a useful tool, made publicly available for free. The compatibility of the tool with Firefox 3.x (and not later versions) is a limitation that is not mentioned in the paper.

Firefox version requirements are now commented on the manuscript, on “Architecture and Technologies” and “Results” section

The evaluation and comparison of the tool to other work/tools is also limited.

A user satisfaction survey is included on the “Results” section

1. Does the software address a novel task? Alternatively, if there is already software available that performs this task, does the software outperform it in terms of speed, reliability, efficiency, or breadth of application?

The software addresses a similar task to the InfoButtons developed by Cimino et al. at Columbia University in the past decade. However, to my knowledge this is first tool of the kind to be freely available as a Firefox plug-in.

Comparison is included on “Discussion” section

2. Is it easy to use?

The software seems fairly easy to use (except where qualifiers are concerned – see # 6). One concern is the compatibility with Firefox 3.x and not later versions. The current version of Firefox is 3.7 – I had to replace my current version of Firefox with an older one (which may not be maintained by Mozilla in the future) in order to install the software. This might be an inconvenience for users requiring a recent version of Firefox for other needs, since I don’t think it’s possible to have two different versions installed concurrently.

Regarding the Firefox version required for CDAPubMed, it has been commented on the paper and the software website. Although further discussion is out of the scope of this paper, due to the interest of the reviewer and some external experts on this issue, we include further comments here. Mozilla changed its version release policy lately (from Firefox 4+, after we started the development of CDAPubMed). Similar to some Linux distributions, Mozilla committed to release a new major version periodically, even when there are major issues in the new version or not... In our opinion, that is only a marketing strategy, aiming to encourage users
to update their browser. However, Firefox new versions cannot be considered "stable" following the traditional criteria of Mozilla and other organizations. In this regard, the last really stable version is Firefox 3.6.x, the only one really supported and the only one that allows running Java within extensions (required for CDAPubMed MeSH term identification process). It is not only CDAPubMed, since other Firefox extensions—with such significant examples like Google Gears for instance, required for GMail Offline—, only works on Firefox 3.6.x. Firefox 9 is supposed to support Java on extensions again, but at the time of writing this third version of our paper, the latest available version of Firefox is 8.0.1.

3. Does it satisfactorily address the task or application the authors intend?

The software does address the task as described, i.e. it assists in querying PubMed based on keywords found in EHRs in HL7 format.

4. Is the software freely available for non-commercial use (note that this is a condition of publication)? And is the availability of the software and any restrictions on use clearly stated in the manuscript?

The software freely is available at the URL listed in the paper. The paper does state that the software should be used with HL7-CDA documents. However, the main restriction i.e. compatibility with an ancient version of Firefox is not mentioned in the paper. It is mentioned in the user manual freely available at the download URL.

Firefox version requirements are now commented on the manuscript

5. Does the manuscript clearly describe the problem the software is designed to address

Yes, it does.

6. Does the manuscript clearly describe how the software is implemented?

Relevant keywords for biomedical literature search are extracted from EHR free-text by matching “sentences and words” (p. 4) extracted by the OpenNLP package to a list of MeSH Descriptors or Entry Terms. These terms are then used to build queries submitted to PubMed. Very little detail is provided on the keyword extraction process. For example, I did not understand how the authors used MeSH qualifiers. I tested the software on some of the sample EHRs provided by the authors and I was not able to generate a query with qualifiers, even when expressions such as “history of violence” were highlighted (en003.xml). The automatic query generated was (history [mh]) AND (violence [mh]) when violence/history[mh] would clearly have been more appropriate.

“History” allowable qualifiers should be included through the configuration module for the “Alerts” section on the EHR.

7. Does the manuscript clearly describe how the software performs and its advantages / limitations over existing applications?

The evaluation was performed on 17 EHRs. This is a small number of documents, but it could be considered acceptable for a proof-of-concept. However, the issue is with the evaluation itself. For the indexing part of the process, the authors state that “Keywords from each HER of the dataset (…) were compared to a manual identification performed by an expert”. Additional information would have been useful on the guidelines given to the expert for identifying the gold standard keywords. Was the expert shown the algorithm results for validation? What was the expert’s expertise? MeSH indexing? Biomedical terminology? Was the expert an MD? A linguist?
Further details regarding the evaluation of the term identification process are now commented on the manuscript.

The performance shown in table 1 seems very high. It would have been helpful to compare these results with either a baseline (e.g. plain string matching) or a state-of-the-art tool (e.g. MTI by Aronson et al.).

The methods suggested by the reviewer are referenced and included as future lines because they undertake a different task than CDAPubMed. Instead of aiming to index clinical text with a limited number of MeSH terms, the CDAPubMed term identification module aims to identify every possible term, relevant for scientific literature retrieval. Thus, a comparison is not possible.

For the retrieval part of the process, the evaluation is basically limited to the observation that the queries that can be generated with the tool are more specific than a query using only the keyword related to the “present condition” of the EHR. This is inherent to the process of query construction, so really this “evaluation” is not doing anything. It would have been more useful to measure user satisfaction (usability of the system for HER related information search) or the relevance of the documents retrieved (user-assessed relevance with respect to the EHR context).

We have included an evaluation on the usability of the system.

8. Does the manuscript state the software’s operating requirements?

The description of operating requirements is incomplete (see # 4).

Firefox version requirements are now commented on the manuscript.

9. Are the discussion and conclusions of the manuscript well balanced and adequately supported by the data?

The discussion of the most relevant aspects to this work is very thin. InfoButtons are not discussed at all (they are only briefly mentioned in the background section), although there is ground for a rich and interesting comparison.

A comparison is now included in the Discussion section.

The discussion mentions other MeSH indexing tools such as MTI without any substantial comparison of performance or any other aspect. It is limited to a bare acknowledgment of the existence of such tools that “could be applied in future implementations” (p. 6).

See answer to # 7.

The conclusion is that the authors aimed at developing the software, and they did it. That much is true.

10. Do the title and abstract of the manuscript accurately convey what has been found?

Yes.

11. Is the writing acceptable?

Yes.
Major Compulsory Revision:

• Improve the evaluation e.g. by comparing the keyword extraction to a baseline or state-of-the-art method and by assessing user satisfaction and the relevance of retrieved documents.

_We have included a user satisfaction survey on the system, available at http://porter.dia.fi.upm.es/cdapubmed/user-satisfaction-survey_

• Improve the discussion of related work and the comparison to InfoButtons and MeSH indexing tools.

_Comparison is included on the “Discussion” section_

Minor Essential Revisions:

• The issue of the compatibility to Firefox 3.x (and not later versions) should be highlighted, e.g. on page 3 in the section “Architecture and Technologies”

_Firefox version requirements are now commented on the manuscript on the “Architecture and Technologies” section_

• The authors refer repeatedly to the “MeSH taxonomy”. “MeSH thesaurus” would be more appropriate.

_Changed_

• On page 3, the authors state that there are “172,000 synonyms and 24,000 MeSH terms”. This is a vague and imprecise statement. A better alternative would be: “MeSH 2011 contains 177,000 Entry Terms and 26,142 Main Headings”.

_Changed_

• In general it is useful to specifically indicate which version of MeSH is being used in experiments (MeSH is updated every year). When providing the results of a PubMed query (e.g. page 5) it is also useful to indicate the date that the search was performed on (PubMed is updated daily).

_The MeSH version and PubMed query dates are now included on the new version of the manuscript_

• On page 4, it is unclear what the authors mean by “The [mh] suffix specifies that the selected keyword is the respective MeSH term not the synonym present in the EHR”. First, a search on a MeSH Main Heading (e.g. diabetes type 1 [mh]) and its Entry Term (e.g. diabetes mellitus, insulin-dependent [mh]) yield the exact same results. Second, the [mh] field indicates that the search will be limited to MEDLINE citations indexed with the relevant MeSH term (as opposed to, e.g. PubMed records containing the term phrase in the title or abstract).

_Changed on the new version of the manuscript_

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
We are looking forward to hearing from you.

Sincerely yours,

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