

PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Qualitative analysis of vendor discussions on the procurement of Computerized Physician Order Entry and Clinical Decision Support systems in hospitals
AUTHORS	Cresswell, Kathrin; Lee, Lisa; Slee, Ann; Coleman, Jamie; Bates, David; Sheikh, Aziz

VERSION 1 - REVIEW

REVIEWER	Andrew Georgiou Centre for Health Systems and Safety Research, Australian Institute of Health Innovation, Macquarie University, Sydney Australia.
REVIEW RETURNED	20-May-2015

GENERAL COMMENTS	<p>This is an interesting and lucid piece of work that provides some valuable perspectives on key issues related to the implementation of clinical information systems in hospitals. The authors present a convincing argument for undertaking an examination of vendor perspectives in the Introduction and the results from the study provide some practical and useful additions to the evidence base in this field. I have the following suggestions for revision:</p> <ol style="list-style-type: none">1. The paper currently does not provide enough information about the selection of vendors. At present we are told that the decision was based on previous work. We need a little more explanation of this decision to be able to be confident that the sample choice and size was appropriate to the research question.2. The paper currently tells us a little bit about the characteristics of the participants, but very little about the broad characteristics of the vendor organisations.3. The Data Analysis section of the paper could also be strengthened. I am particularly interested to know how the study addressed issues related to the study team's "confidence" in their analyses. For instance, how many of the researchers coded the data? What are the qualitative research credentials of the research team? What does "refined through discussion within the research team" mean? Was this informal or structured?4. I would like the authors to comment on whether the findings were consistent to all the participants and/or whether any divergent themes appeared or were uncovered.5. The Discussion section is well presented and addresses key issues related to the transferability of the data. The paper also addresses how its findings related to other existing evidence about "buy-in", "financial resources" and "work process re-design". However, I was unsure why the authors did not contrast and discuss any evidence about hospital managers' perceptions about vendors and their behaviour. This would have been interesting and valuable particularly in regard to issues about: a) the creation of formal partnerships between hospitals and vendors; and b) the optimisation
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	of systems and the derivation of data.
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REVIEWER	Rhonda Schoville University of Michigan, USA
REVIEW RETURNED	20-Jun-2015

GENERAL COMMENTS	<p>Very timely and needed study.</p> <ol style="list-style-type: none"> 1. Abstract has several words that have ran together (first sentence and again with second sentence with strengths and limitations). 2. Study questions is not evident 3. Aim is clear 4. The study has a very small number of participants but this should not defer the manuscript from being published. It would have been nice to have more participants around 30 so that themes could have been well saturated. Other vendors should also be considered 5. Would recommend a table that outlines strategies for the organizations to consider for vendor and product selection 6. More discussion on the life cycle model that guided the study.
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VERSION 1 – AUTHOR RESPONSE

Reviewer 1

Point 1: The paper currently does not provide enough information about the selection of vendors. At present we are told that the decision was based on previous work. We need a little more explanation of this decision to be able to be confident that the sample choice and size was appropriate to the research question.

Response: As suggested, we now provide more information on the selection of vendor organizations in the Methods section. In doing so, we outline how we have drawn up a list of 17 key vendors currently actively operating (defined as either having implemented a relevant system or being in active discussions with hospitals planning to implement) in the U.K. market. This shortlist of vendors was then reviewed to include vendors that had either implemented systems in the U.K. context or in international contexts, excluding vendors that were selling newly developed systems and had no procurement and implementation experience. Representatives from the remaining 10 organizations were contacted via email to invite them to take part.

Point 2: The paper currently tells us a little bit about the characteristics of the participants, but very little about the broad characteristics of the vendor organizations.

Response: Table 1 has been revised to include characteristics of participants and broad characteristics of vendor organizations relating to system implementation progress, size and national/international reach.

Point 3: The Data Analysis section of the paper could also be strengthened. I am particularly interested to know how the study addressed issues related to the study team’s “confidence” in their analyses. For instance, how many of the researchers coded the data? What are the qualitative research credentials of the research team? What does “refined through discussion within the research team” mean? Was this informal or structured?

Response: The Data Analysis section has been thoroughly revised in addressing the helpful comments of the two expert reviewers. We now elaborate on how the transcripts were initially coded by KC, an experienced qualitative researcher. The emerging categories were then inductively analyzed for recurring themes based on frequency and salience (or agreement amongst participants), in discussion with LL. After initial analysis, emerging themes and sub-themes were refined through

discussion within the research team, consisting of experienced social scientists, clinicians and medical informaticists. This discussion was structured around the three main emerging themes surrounding organizational capabilities, procurement and contracting challenges, and system optimization. It resulted in refinement of sub-categories, with individual team members helping to explore clinical and social implications and challenges outlined by participants in more detail.

Point 4: I would like the authors to comment on whether the findings were consistent to all the participants and/or whether any divergent themes appeared or were uncovered.

Response: The main emerging themes were common amongst participants, with no divergent opinions on the main issues. There were, however, some minor disagreements in relation to specifics, particularly regarding the degree of standardization of contracts between healthcare organizations and vendors, the nature of vendor involvement in actual implementation-related activities, and the commercial capacity to deliver desired functionality. We have included a paragraph to that effect in the Discussion section.

Point 5: The Discussion section is well presented and addresses key issues related to the transferability of the data. The paper also addresses how its findings related to other existing evidence about “buy-in”, “financial resources” and “work process re-design”. However, I was unsure why the authors did not contrast and discuss any evidence about hospital managers’ perceptions about vendors and their behavior. This would have been interesting and valuable particularly in regard to issues about: a) the creation of formal partnerships between hospitals and vendors; and b) the optimization of systems and the derivation of data.

Response: Thank you for this suggestion. The discussion has now been revised accordingly. We suggest that vendor views may be missing in current managerial discourses, as these are often focused on localized organizational change. Future work should therefore examine these issues in more detail, particularly in relation to a potential alignment of organizational and vendor priorities and the optimization of systems.

Reviewer 2

Point 6: Abstract has several words that have ran together (first sentence and again with second sentence with strengths and limitations).

Response: We have carefully studied the formatting of the manuscript and revised accordingly.

Point 7: Study question is not evident

Response: The research question is now more explicitly stated in the Introduction section of the manuscript. In responding to this comment, we have added the following sentence: “Our primary research question was: What are the challenges surrounding the procurement of hospital CPOE/CDS systems from vendors perspective and how may these be addressed?”

Point 8: The study has a very small number of participants but this should not defer the manuscript from being published. It would have been nice to have more participants around 30 so that themes could have been well saturated. Other vendors should also be considered.

Response: We agree that the number of participants is small and that ideally we would have had the opportunity to study a broader range of vendor perspectives. This has now been more explicitly acknowledged as a limitation in the Discussion, stating that despite the limited number of participants and range of (albeit key) vendors, and the associated potentially limited transferability of findings, the work has identified important lessons. In addition, the relatively intimate format allowed a very rich, interactive discussion, which would have been more difficult with a larger number of participants. We have further added a sentence in the Data Analysis section indicating that we have achieved thematic saturation during the work,(1) as we have reached a point in the data analysis where themes were repeatedly identified and no new themes were emerging.

Point 9: Would recommend a table that outlines strategies for the organizations to consider for vendor and product selection.

Response: We have incorporated a new box in the Discussion section as suggested. This highlights the following strategies for organizations to consider in relation to product/vendor selection:

- Taking time throughout procurement processes to assess organizational needs and base product/vendor selection on this need
- Meaningful long-term engagement with different vendors and assessment of a range of products
- Harnessing implementation expertise of vendors and making this explicit in contractual arrangements
- Choosing products that are likely to be able to cope with future challenges surrounding secondary uses of data and interoperability

Point 10: More discussion on the life cycle model that guided the study.

Response: The discussion surrounding the lifecycle model has been expanded in the Analysis section. We now outline that the model consists of the following iterative stages: conceptualization, project initiation, functional specification, drafting a business case, procurement/tendering, system choice, contracting, pre-implementation planning, implementation, optimization. Conceptualizing procurement with this model helped to contextualize findings within the larger implementation journey, as the stages are intimately related and can impact on one another.

We are very grateful for the opportunity to respond to this thoughtful and constructive feedback from your expert reviewers, which has helped us to improve the quality and salience of our work. We believe we have responded to all of the points made and hope that the paper is now suitable for publication. Please do not however hesitate to contact us if you require any further revisions or clarification.

With kind regards,

Kathrin Cresswell (on behalf of the co-authors)

Reference

1. Guest G, Bunce A, Johnson L. How many interviews are enough? An experiment with data saturation and variability. *Field Methods* 2006;18(1):59-82.