Author’s response to reviews

Title: Harnessing mobile devices to support the delivery of community-based clinical care: a participatory evaluation

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Author’s response to reviews:

Dear editorial team

Thank you for sending reviewer comments. We have made changes in the manuscript accordingly and have responded to queries below. Revisions in the manuscripts are tracked.

One author has joined Apple Inc since the submission of the manuscript and has indicated a conflict of interest due to his new post; he has therefore given permission to resubmit without him as an author. We have made these changes on the title page to reflect this.

We hope the changes are satisfactory.

Yours faithfully,
Dr Jasmine Harvey and Professor John Powell

Response to review commentary

Thank you for the opportunity to review this paper reporting the introduction of 3,000 iPads, in an NHS Trust in England, for use by healthcare clinicians working within the community. An interesting situation.

Our response: Thank you for your comments
A participatory research approach was used. In many ways the paper describes a classic case of how not to go about introducing a telemedicine solution. The problems associated with, and the frequent failure of, the top down approach of putting technology in the way of the end user and expecting them to use it are well documented in the literature. As is the failure to get end user buy-in before implementation and failure to implement a change management plan. These are alluded to in the paper but not actually identified, discussed or contextualized within global experience. The challenges experienced by the IT staff and community clinicians are not novel. In effect this is yet another report of a poorly planned and implemented telemedicine initiative. That it appears to be working is due to the benefits that the users have eventually experienced.

Our response: Thank you for your comment. Please note that the project did not introduce a telemedicine solution. The project aim was to support clinician mobility by introducing iPads. The purpose of the paper is not to present a review of the overall project approach and methodology. Rather, it aims to provide a focused review of key elements of the project.

The project occurred as part of a real-world endeavour. As so often happens in the NHS, it was constrained by both time and resource. On this occasion the project was added-in to an already full schedule of work as the funding opportunity to procure the 2,000 iPads was presented quite quickly with tight deadlines expected by the Dept of Health in terms of expenditure and implementation. The project was managed according to Prince 2 project management methodologies.

It is fair to conclude that lessons can be learned, but this is precisely why the participatory research was undertaken. The overall outcome of the project is that the solution implemented has transformed care delivery and is viewed extremely positively by staff. This is testament to the fact that in order to account for the real-world constraints of the project, the decision was taken to focus on ensuring benefits were delivered. These didn’t just materialise as your comment appears to imply, but were the direct result of the determination and persistence of the project team to keep users focused on the benefits that they will achieve as a result of the new capability the project delivered.

All too often NHS projects receive criticism for not following a rigid framework to deliver the perceived project output. The Trust team are very experienced at delivering projects in the real-world. They understand that delivering an output is not the aim of any project. Instead they focus on delivering the output and the associated capability in the understanding that this is what leads to the expected benefits. As you have indicated, the paper has identified that this outcome has been achieved.

The authors go to some length to explain participatory research in the methods section and discuss it in some detail in the discussion. There is very little reference to anything else. What of the existing literature on the use of mobile devices at point of care and the issues related to their
implementation and use? Were the findings of this study novel or the same as those reported in previous telemedicine implementation studies? There is also no discussion on the evidently poor planning of the project. How did the planning compare with the 18 critical success factors for deploying telemedicine presented by the Momentum group, or Yellowlees' long standing seven success factors? What new lessons are to be learned from this study?

Our response: Thank you for your comments. Our study was a formative one, which aim to find factors that could influence successful long-term adoption of the iPad during its early implementation, hence we were more focused on new novel methods that could extract detailed factors to inform implementation. This probably explains why we emphasised our participatory method, which led us to discover that during implementation, frequent informal ‘socialised’ meetings between the early adopters and the implementation team is essential.

You are correct in stating that many literatures have identified factors that influence the success or failure of digital healthcare projects. What we are trying to explain in our paper is not that we have found a new factor per se, but rather, by approaching the formative evaluation of early adopters differently, we have found that users prefer to have frequent informal meetings between themselves and anyone else involved in the implementation so they can share ideas and adapt the new technology together.

We have made this clearer in contextualisation of our findings and hope it is satisfactory.

Queries:

1. What connectivity was provided for the iPads? I presume a SIM card with a data allocation/package. This is not stated anywhere. If this is correct, how much data were they allocated to use each month? Was private use of data an issue? This is important for others to understand when budgeting for similar interventions.

Our response: Thank you for your comment. We have updated the paper to reflect the fact that all of the iPads were provisioned with Wi-Fi and 3G/4G mobile data connection. Initially, each iPad had a specified amount of mobile data available for use before additional charges were applied. This was subsequently replaced with an organisation-wide contract for mobile data, whereby one combined monthly data bundle was shared across all devices. Whilst individual user’s mobile data usage was monitored, this was done in the context of educating the user to alternatives when mobile data usage was identified as excessive. One example of how users sought alternatives was asking patients to allow them to use Wi-Fi whilst in a patient’s home.
As the excerpts below showed, some were aware the expensive data usage and wanted to save the trust money and others changed their habits when they became aware of it. We appreciate this information could help other implementing teams so we have it clearer in the manuscript.

“We got an email recently to say some people had been going over their limits and can people be aware of what they are using it and not to use it as much as you can on Wi-Fi and not on the 4G or 3G. When I started I was never told. All I was told was, you can use it for personal use as well and I went, eh. But no-one ever said and I know people do take them away on holiday to use. So [erm], but I wasn't aware there was a limit. I hadn't been told that I'd gone over mine, so I am presuming I haven't” (Source 2).

“I hadn't heard of anyone being charged” (Source 3 Female 1); “I must admit that. It's not a problem of mine. I've always been working on the principle that the Trust have a good deal for allowing 3G” (source 3 Male 1).

2. While privacy is mentioned in terms of work now overlapping with their private lives what steps were taken to insure data privacy and security on the iPads. What security was in place if the iPad was mislaid or stolen? After transmitting data via the iPad was it deleted from the iPad? If so, was this done automatically or did the healthcare clinician have to remember to do this? How was email and other patient data made secure on the iPad?

Our response: Thank you for your comment. As stated in the paper, the iPads have built-in security which includes the ability to track and locate the device if lost or stolen. For an additional level of management and security purposes, the iPads were managed using a Mobile Device Management (MDM) solution. MDMs have a significant number of features that address all concerns related to data privacy, security, segregation of personal / private data, and so on. The list of features available differ by MDM supplier, but overall, they all provide a similar set. It’s beyond the scope of the paper to provide details about MDM solutions, but the expectation is that the reader can easily find out more via Google.

3. Although the study was classified as a service evaluation and thus not requiring ethical approval, did patients consent to having their data acquired, transmitted and then stored?

Our response: Patients did not contribute to the study – only healthcare professionals and consent was sought from all participants. We have made this clearer in the manuscript.
4. Healthcare clinicians were identified by the IT team for interview. Were there any guidelines as to who should be selected? Was there an even mix of early and late adopters of iPad use? Was there a chance of bias in the selection process at this step?

Our response: Selection of participants were based on who were using the iPads and available to take part in the study. All users were considered early adopters since implementation had been least than year. Even though participants were identified by the IT team, they had to consent to be part of the study. Not all participants identified consented. In our limitations sections of the study on page 14, we have explained the possibility of a bias in the selection process. This is the full text under strengths and limitations in the manuscript:

“Participatory techniques allowed a deep involvement from stakeholders in the study, with excellent access to user groups, and the opportunity to study a live initiative. However, they can introduce bias in relation to how the study participants were selected and there is a possibility that involving stakeholders in all stages of the study skewed the results in a different direction to another evaluation model. The group nature of eliciting information created the potential that not every participant felt free to express all their experiences, and because this was not longitudinal data from a prospective study we were not able to study changes over time.

5. The paper would benefit from contextualizing the findings of this study within current global experience of point of care data acquisition by healthcare professionals and community health workers, the deployment of mobile devices to healthcare workers providing services in the community, and relatively large scale telemedicine implementation. The balance of the paper appears to be skewed towards explaining participatory research. The planning behind providing 3,000 iPads for use within one authority is of great interest but not described. The challenges identified are the result of the planning.

Our response: We have made changes in the introduction and discussion to contextualise mobile technology used for community care in the global context. Changes include explaining the background of our study in the global context on page 2, putting into the planning and strategy of the initiative in relation to other literature on page 14 and then explaining our how our approach to the study enabled us to find that socialised environments settings are useful for the sustainable in addition to using checklists and models. We hope that is satisfactory.

The reviewer’s comment is very appropriate. It reflects the fact that the paper is reflecting a position that’s now almost five years old. The world has moved-on and in many respects many of the reported problems and findings in the paper have broadly been superseded. For example, the way that iPads are now deployed and updated require zero-touch from IT departments. You can literally send the device to a user’s home as long as it’s been procured by a Trust through an approved Apple reseller, and once it is switched on and on the network configuration
automatically happens with the necessary apps, wallpaper, user settings, etc. just appearing on the device.

There is an inevitable delay between fieldwork, analysis, writing up and the peer-review process" and that this means that the initiative is a little out of date although we believe the findings are still highly relevant to health services seeking to adopt similar technology at scale.