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**Citation:** Randell, R. & Wilson, S. (2010). New hardware platforms for healthcare consultations. Paper presented at the Workshop on Interactive Systems in Healthcare (WISH), 11 April 2010, Atlanta, Georgia.

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# New hardware platforms for healthcare consultations

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**Abstract**

Innovative hardware platforms such as Mobile Clinical Assistants and tabletop computers are emerging that have the potential to significantly impact the interaction between clinician and patient. This position paper describes the results of interviews undertaken with General Practitioners as part of an experimental study to explore how innovative hardware platforms impact patient-clinician communication. We reflect on the lessons learnt from the study, both in terms of the implications for the design of such studies and possible directions for the introduction of new hardware technologies into healthcare consultations.

**Keywords**

Healthcare, evaluation

**ACM Classification Keywords**

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

**Introduction**

Innovative hardware platforms such as Mobile Clinical Assistants (MCAs) and tabletop computers are emerging that have the potential to significantly impact the interaction between clinician and patient. Previous studies of the impact of IT on patient-clinician

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*WISH 2010* April 11, 2010, Atlanta, Georgia, USA.

communication have focused on interaction around a fixed position desktop computer. What has not been studied is how this coordination and communication is impacted by different hardware platforms. This position paper describes the results of interviews undertaken with General Practitioners (GPs) as part of a pilot experimental study to explore how innovative hardware platforms impact patient-clinician communication.

We begin by presenting the methods of our study. We then describe findings from the interviews, and then reflect on the lessons learnt from the study, both in terms of the implications for the design of such studies and possible directions for the introduction of new hardware technologies into healthcare consultations.

## **Methods**

**Experimental task:** GPs participated in simulated consultations with actors as patients presenting with symptoms based on dummy scenarios. The scenarios were developed with the help of a practicing GP. The scenarios were selected to be straightforward, familiar to any GP. All three scenarios were designed to involve a combination of information gathering by the GP and sharing information with the patient. Dummy patient records were developed to support the scenarios. Rather than use an electronic patient record (EPR) system, we created the dummy patient records as spreadsheets in Google docs. We felt that this simple solution would allow us to focus on the impact of the hardware platforms, rather than have the GPs distracted by features of a particular EPR system.

**Hardware solutions:** We had three hardware solutions, a desktop computer, a Panasonic Toughbook CF-H1

MCA tablet PC with touch screen and stylus input device, and a tabletop computer.

**Sample:** Our intention was to recruit 9 participants. However, we stopped the pilot study after 3 participants, for reasons discussed below.

**Procedure:** A within-participant design was used, with each participant using each of the three hardware solutions by participating in three consultations.

**Data:** The simulated consultations were video-recorded. Once all three consultations were completed, a semi-structured interview was conducted, exploring the GPs' perceptions of the different hardware solutions.

**Analysis:** The video data was analysed using Transana ([www.transana.org](http://www.transana.org)). The interviews were transcribed and the transcripts indexed in order to identify key themes.

## **Findings**

Our intention in this position paper is to focus on describing what emerged in the interviews, not to describe what happened within the simulated consultations (this will be reported elsewhere). However, a key feature of all consultations was that none of the GPs recorded patient notes within the consultation, instead choosing to do this afterwards. Our assumption had been that the GPs would make notes within the consultation and we were interested to see how the impact of this on communication between the GP and patient varied according to the hardware used. The GPs also varied significantly in the extent to which they looked up information to share with the patient. This meant that our scenarios provided limited

opportunity for us to understand the impact on communication. It was for this reason that we chose to stop the experiment after three participants, in order to review our scenarios.

The choice to record notes following the consultation was described by one GP in the following way:

*'There's no point in writing and intruding into the flow of what's going on. [...] what you want to do is get the business of the consultation without interruption.'*  
(GP1)

In discussing the use of the computer to look up information to share with the patient, this GP pointed to the fact that 'most consultations are only ten minutes' so that, although he 'might look something up very quickly', opportunities for looking up information within the consultation were limited.

Despite stopping the experiment after three participants, the interviews following the simulated consultations raised interesting issues that have implications for the choice of hardware in healthcare consultations. A key theme, expressed strongly by all three GPs, was a concern over patient confidentiality:

*'If you have family members in the room and a screen of any sort, they can read what's on the screen, sexual history that they're not aware of and all these things they've got up to.'* (GP2)

While all three GPs liked the larger screen provided by the tabletop computer because of the potential for easily sharing information with the patient, the

consequence for patient confidentiality was raised as an issue:

*'Patients often bring in other people with them so if she brought her mum, her boyfriend, and the last consultation that we'd had was about her contraception or her termination or you know the affair she was having [...] if you're using something that's very display centric then it's going to be much more obvious if you're scrabbling to [...] put the screen saver on.'*  
(GP3)

While the MCA was generally unpopular with the GPs, due to difficulties using the stylus and onscreen keyboard/handwriting recognition, the concern for patient confidentiality led one GP to highlight the following advantage of the MCA:

*'It does allow you to [...] position it in a way that you can do it privately, so I quite like that.'* (GP1)

Another key theme in the interviews was the increased use of IT within GP consultations, something which our scenarios failed to adequately reflect:

*'We print out labels for bottles, we print out request forms for tests [...], we do things like spirometry linked in with the computer, [...] Quality and Outcome Framework checks so that we're constantly referring to things that the computer's reminding us that we have to do, like take the blood pressure or weigh the patient.'* (GP1)

Such increased use of IT within the consultation led one GP to anticipate a move to multiple screens. Again, the larger screen of the tabletop computer was seen as

beneficial for this reason, while the smaller screen of the MCA was seen as impractical.

Increased use of IT also meant that speed of data entry was a key concern, hence the dissatisfaction with the stylus input provided by the MCA:

*'For most GPs [...] a lot of it's about data entry [...] and so it's the input method is probably as important as anything else.'* (GP3)

### **Discussion**

The value of simulated consultations for research is accepted, with simulated consultations having been successfully used in previous research exploring the impact of IT on health care professional/patient interaction [1,2]. What is difficult is designing appropriate scenarios. Our scenarios, although developed with a practicing GP, were based on false assumptions about the nature of GP consultations. IT use within GP consultations has increased significantly over recent years. Conducting observations of current practice prior to designing the scenarios may have enabled us to design scenarios that better capture the challenges that GPs experience in fitting IT within the consultation. It is likely that such scenarios would require much more sophisticated patient records, significantly increasing the effort to set up the experimental study.

Our experience also raises questions about the validity of experimental studies. One of the GPs used the internet within each consultation to look up information to share with patients, but the limited time duration of standard consultations means that this may not be normal practice. Again, observations of current practice

prior to conducting such studies would enable researchers to assess the extent to which behaviour observed within the experimental setting reflects current normal practice.

In terms of directions for the introduction of new hardware technologies into healthcare consultations, the concerns expressed by the GPs we interviewed suggest that maybe a combination of hardware platforms is required. For example, a larger screen may be beneficial for sharing information with the patient but a smaller screen that the GP can orient as they wish may be beneficial in terms of protecting patient confidentiality.

### **Acknowledgements**

We would like to thank the GPs who participated in the study and Dr Peter Davis who assisted us in the development of the scenarios. This research was funded by a pump priming grant from City University London.

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