

# “Collaboration Spaces” and Health Information Technologies

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## Abstract

*Collaboration plays a significant role in healthcare delivery. However the collaboration space, which consists of the processes, people, and contexts where collaboration occurs, remains poorly understood and supported. A better understanding of the collaboration space is essential for the development of health information technologies (HIT) that truly supports collaboration. In this poster, we present a preliminary analysis of a systematic literature review that we have been conducting on collaboration research in the biomedical informatics community to better understand collaboration spaces.*

## INTRODUCTION

There are a growing number of national commissions and reports calling for increased collaborative care delivery as way of improving healthcare delivery [1]. However, the complexity of designing and implementing technologies to support collaborative practices can be a significant challenge because of the wide variety of contexts and processes that comprise collaborative care delivery [2]. Researchers from a range of fields including Human-Computer Interaction (HCI) and Biomedical Informatics have been studying this issue for a number of years. The challenge is to integrate the research from these different disciplines in order to support the development of meaningful interventions to support collaborative care delivery.

Federal mandates and the efforts of the Office of the National Coordinator for Health Information Technology (ONC) have started to foster increased adoption of health information technologies (HIT) [3]. Yet, despite the significant role that collaboration plays in healthcare delivery, the focus on the development of collaborative HIT has not received the same emphasis. Consequently, we argue that we need to develop a better understanding of the “collaboration space” [4]. Our use of the term “collaboration space” is an extension of Coiera’s notion of a communication space [5]. We envision a collaboration space to include the processes, people, and contexts where collaboration occurs [4]. The concept of collaboration space focuses us on the sociotechnical aspects of collaboration – both the social aspects of collaboration and the technical mechanism of supporting it. Developing a more detailed understanding of the collaboration space would provide us an inventory of collaborative care structures, processes and outcomes enabling us to better design, implement and evaluate technology to support meaningful collaboration.

## METHODOLOGY

To study the concept of collaboration space, we have begun a systematic review of collaboration research published in the medical informatics community from 1990 to 2013. We focused our attention on journals including Journal of American Medical Informatics Association, Journal of Biomedical Informatics, International Journal of Medical Informatics, Methods of Information in Medicine and on conferences including MedInfo and AMIA. We identified 170 papers from this time period that discussed collaboration.

## RESULTS

We analyzed the papers across three different categories: technology types, study locations, and study methodologies.

### Technology Types

Collaborative technologies fall into two categories – technologies to support co-located collaboration and technology to support non-located technology. Many of the papers focused on technologies that supported co-located collaborations such computerized physician order entry systems (CPOE) [6]. Other papers focused on technologies to support geographically dispersed medical teams, such as 3D telepresence, remote monitoring systems, and telemedicine systems [7].

### Study Locations

Most collaboration studies took place in hospitals [8]. Within hospitals, a number of studies focused on collaboration in intensive care units and emergency departments. This is not surprising considering the highly

collaborative and information-intensive nature of these units. A few studies have focused on settings outside the hospital such as ambulatory clinics, hospices, and nursing homes [9].

### Study Methodologies

Most studies examining collaboration used qualitative or mixed methods (qualitative and quantitative) [2,6]. Very few studies used only quantitative methods. Researchers have focused on qualitative and mixed methods as the best approach to getting the in-depth type of data needed to understand collaboration.

### DISCUSSION

Despite the focus on providing more collaborative care delivery, it is difficult to manage “collaboration” because it is such a multi-faceted concept. Instead, we need to understand how to manage the individual parts that comprise collaboration spaces. Furthermore, since collaboration is often implicit within the workflow and sometimes difficult to capture, HIT are often not designed to support collaboration as effectively as they could be. Therefore, a more detailed understanding of collaborative spaces would enable us to better design HIT to support collaboration.

Collaboration, like many parts of healthcare delivery, is a set of complex interactions. No single field on its own can fully understand the nature of collaboration spaces. Therefore, we need to integrate research from a variety of different fields (i.e., CSCW, HCI, Organizational Studies, Biomedical Informatics) in order to better understand collaboration spaces in healthcare. This is essential if we want to develop and maintain effective collaborative HIT.

Finally, all collaborative processes are “not equal”. There are many different types of collaborative processes and technologies need to support these different types of processes. For instance, certain types of collaboration are routine and require little support while others are much more complex and require more substantial support. Therefore, understanding collaborative spaces would help us develop work practices and technologies to support ‘meaningful collaboration.’

### CONCLUSION

We are starting to explore the concept of “collaboration spaces” in healthcare settings through a systematic literature review of collaboration studies in the biomedical informatics literature over the past two decades. Through this literature review, we hope to provide a better understanding of the current state of the art in healthcare collaboration.

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