

Chapter 21

Dynamic Business Processes and Virtual Communities in Wireless eHealth Environments

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ABSTRACT

Computer Supported Collaborative Work (CSCW) related applications tend to be a trend for most successful businesses, organizations and domains nowadays, as is the Healthcare sector. Healthcare specialists often work in remote areas facing many problems and challenges driven mainly from the limitations and constraints of the mobile and wireless technologies in relation to the tasks at hand. Due to the sensitive area of healthcare provision, this chapter discusses that additional features need to be incorporated in current CSCW systems, like the dynamic creation of medical virtual teams, dynamic workflows and the automatic triggered events upon time expiration, in order to be more effective and efficient. In this respect and having in mind the new Web 2.0 characteristics, a set of new features applied in our proposed CSCW system, DITIS, is analyzed in an attempt to encapsulate all the needs of eHealth applications. Furthermore, an extensive evaluation of the system is presented, supporting the need for such enhancements since a significant increase in communication, coordination and collaboration has been shown among the subjects.

DOI: 10.4018/978-1-61520-777-0.ch021

INTRODUCTION

Nowadays, many organizations are distributed across sites, in different countries and continents. Within these organizations the nature of working activities is constantly changing due to this geographical expansion and diversification of practices. Employees are now on the move with their notebooks, Personal Digital Assistants (PDAs) and mobile phones. Some have referred to this trend as nomadic working (G Reif et al. 2001). These organizations have to provide an effective IT infrastructure to enable their employees to share information and collaborate efficiently. Therefore, the need of supportive Computer Supported Collaborative Work (CSCW) systems is spawned. Analyzing more thoroughly this nomadic way of working further constrains of the wireless environment/medium arise, like the mobile devices capabilities, the delivery of an effective and efficient collaboration, the lack of dynamic workflows and the need for time driven events. Thus, a big challenge is to deploy a competent CSCW system that will satisfy all the aforementioned conceptualizations and limitations to the benefit of the end user.

CSCW-related applications tend to be a trend for most successful businesses and organizations, and especially for the healthcare sector. Healthcare specialists often work in remote areas where the wireless network is limited with many disconnections, while they are experiencing problems with the devices constrains like the small sizes with inefficient input methods, small screens, limited battery life and are prone to damage and spoilage. In this respect, the need for dynamic workflows development and time driven events came to the surface. Specialists expect substantial help from the system they are using, saving them time and effort, i.e. they should not analyze their requirements all over again, waiting for developers to add the new workflow into the system. Furthermore, particular events may underlie some time constraints according the priority of the medical incident.

In general, eHealth applications are far more demanding than any other systems and the need of approaches that will consider all the above-mentioned problems and constraints should be formulated. Such systems must have:

- **Availability awareness:** The system must be aware on the user status (availability), in order to manage better any critical situations.
- **Flexible messaging methods:** Healthcare specialists are not always computer literate and the system has to adopt to their communication skills. Some specialists prefer the use of emails and other prefer the use of SMS text messages. The system has to provide all means of communication.
- **Confidentiality:** One of the special needs of an eHealth application is the confidentiality of the information. Patient's data are sensitive information and can't be viewed by anyone. Laws were instituted for protecting this kind of data and thus, eHealth applications have to follow these strict guidelines.
- **Security:** In order to support the above characteristic, solid security schemas have to be enforced. Furthermore, we have to provide data restriction access not only table or column level but also row level (database rows and columns). This is due the confidentiality of the data, not only between roles, but also between users. For example, doctors don't share their patient's information with other doctors (row level security).
- **Availability:** An eHealth application has to be available 24/7 from anyplace and by any means. For example, users can access the application even from a mobile phone while they are at the beach.
- **Expandability:** An eHealth application has to be able to expand easily with new features and services. If not, the rapid

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