Chapter 3.25
Multimedia Capture, Collaboration, and Knowledge Management

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ABSTRACT

This chapter presents methods and technologies from Siemens Corporate Research that can assist in the process of creating multimedia collaborative knowledge bases: capture, querying, visualization, archiving, and reusability of multimedia knowledge bases. A selection of Siemens products in the healthcare and communication domains are introduced, above which novel multimedia collaboration and knowledge management technologies have been developed by the authors. With examples, it is explained how in concert these technologies can contribute to streamlining the processes within healthcare enterprises, telemedicine environments and home healthcare practices.

INTRODUCTION AND MOTIVATION

The networked healthcare enterprise is providing unprecedented opportunities for healthcare workers to collaborate and make clinical decisions in an efficient manner. Significant progress has been made to enable healthcare personnel to obtain answers to simple clinical questions by using medical databases of evidence-based answers. This approach allows reuse and sharing of knowledge to help healthcare professionals to save time and effort and help patients in an efficient manner. For situations where healthcare workers have simple questions with simple answers, this approach is perhaps overkill. However, when the questions are of a more complex nature, by capturing and archiving complex answers in a rich multimedia form they can be exploited multiple in the future

to explain solutions in a manner that can be easily digested by healthcare workers.

A contemporary healthcare enterprise involves complex media elements (images, videos, documents, etc.) and volumes of documentation both digital and on paper. The healthcare knowledge base should incorporate these media elements and easily allow users to search, extract, and reuse. Some of the modern knowledge management systems allow building of communities of practice around documents. But there is a need to move beyond regular office documents to address rich media and encompass specialized medical and clinical data.

The networked enterprise is also enabling a plethora of ways for healthcare personnel to communicate and collaborate. The next generation of communication technologies will bring converged voice and data solutions on a single network. This is helping integrate the healthcare IT (Information Technology) systems with Web-based communications. In recent years we have witnessed a proliferation of communication and data devices like GPRS cellular phones and PDAs, thus providing an opportunity for accessing clinical information anywhere/anytime and allowing users to collaborate over clinical information to reach decisions quickly.

The concept of presence and availability offered by various instant messaging tools is changing the manner in which people are communicating with each other. Presence enables a user to know who in their contact or buddy list is available or not at any given point in time. Availability options allow a user to signal whether they are available to be contacted and which form of communication they favor. Presence and availability information allow users to interact in various ways in offline, real-time or in near-real time modes. Mobile communication technologies are being developed that enables mobile location and presence. The integration of the healthcare enterprise content repository with a Web-based infrastructure and presence and availability

represent the three pillars of modern unified, or converged, communication.

Although the potential for a rich communications and IT infrastructure is high, there remains a need to streamline the communications and collaborations between healthcare personnel to ensure that valuable knowledge gained from daily interactions between healthcare personnel is not lost. This chapter presents methods and technologies from Siemens Corporate Research that can assist in the process of creating multimedia collaborative knowledge bases: capture, querying, visualization, archiving, and reusability of multimedia knowledge bases. Throughout the chapter, a number of Web-based technologies are introduced that enable healthcare personnel to interact in a variety of modes regardless of whether they are mobile or sedentary.

BACKGROUND: STREAMLINING HEALTHCARE AND TELEHEALTH

Since the advent of Web-based workflows, there has been a growing emphasis in healthcare enterprises on methods to increase organizational efficiencies, reduce errors and focus on patient care. One such platform is Soarian (Siemens Soarian) from Siemens Medical (Siemens Medical) that offers an integrated workflow technology that can streamline the operational processes of healthcare. Soarian's infrastructure has been engineered based on clinical processes that enable physicians to focus less on administrative duties and more care by providing them with access to all clinical data in a single view. The goals being to offer actionable guidelines to clinicians based on best practices and to support them in reaching accurate, evidence-based decisions promptly.

A nascent area for which technology can be a significant enabler is that of telemedicine (Hibbert, Mair, May, Boland, O'Connor, Capewell, & Angus, 2004), where clinical needs are extended beyond the boundary of the hospital. A key re-

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