Chapter 45
A Multichannel Framework for Multimedia Content Deployment in E–Health Environments

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ABSTRACT
In this chapter, the authors examine the technical background behind the general problem of multimedia content deployment, and the architectural and technical choices and legal implications to be considered in order to build an effective client/server multimedia content deployment platform. This platform is suited for the implementation and spreading of a series of services, integrated with the Health Information System and the related educational and recreational facilities and support activities. Such infrastructure requires a strong convergence of expertise and innovative technologies to integrate system components and guarantee security, usability, and interoperability as recommended by IHE.

INTRODUCTION
Since the beginning of the last century the hospital has increasingly become a place of primary health care. The discovery and development of ever more sophisticated drugs and diagnostic technologies led to its success and organizational development. The healthcare organizational model slowly evolved into structures oriented predominantly towards the provision of services (day hospital, outpatient, diagnostic) with short hospital stays and targeted at the most serious cases, resulting in a profound change in the culture of management of health facilities.

An immediate consequence is that you cannot run a hospital without an adequate Health Information System. Hospitals are real businesses that provide thousands of services varied greatly
among them, employ different systems and technology, work seamlessly, and must meet hotel requirements of users and their families.

Since health facilities deal with people and not objects, it is also essential that they provide a range of ancillary services to facilitate the management of everyday issues and entertainment needs that can determine their success or failure.

The efficient and generalized deployment of rich multimedia contents (both live and on demand) is a challenging target that is becoming more and more important in the modern information society, due to the growing need for multimedia contents in various target environments such as health, education, long-life learning, etc.

This can be accomplished through the development of a flexible and efficient platform, which is required in order to implement and spread a series of services related both to the specific health environment (integration with the Health Information System) and the related general educational (classroom lessons, on line participation and deferred streaming) and recreational facilities (such as TV and radio live and on demand streaming) and support activities (i.e. phone and video calls).

The analysis, design and development of such an infrastructure dedicated to the distribution of multi-channel content in health environments (a challenge for Healthcare Chief Information Officers) require a strong convergence of expertise and innovative technologies to achieve the integration of functional components of the system in synergy with the objectives of security and usability.

These general needs follow the IHE (Integrating the Healthcare Enterprise) guidelines (IHE, 2011). IHE is an international working group that works in synergy with associations related to health (ACR, NEMA, EAR, ECR, SIRM, etc.) and promotes the use of standards already established in the medical field. IHE does not mandate how system components are made, but how they can connect and interoperate with each other. To this end, it attempts to harmonize the use of existing standards (DICOM, HL7, XML, etc.) and every year offers a connect-a-thon between the companies to test interoperability.

The areas involved in the construction of such infrastructural framework concern, on the one hand, both the design and management of digital data communication networks and related security issues, and on the other the integration of new technologies in the area of live and on-demand transmission of voice and video, and a variety of highly professional management and system services.

In this chapter, we present a multimedia content delivery platform together with its infrastructural and architectural framework’s aspects, both from the technological and legal point of view. First, the technical background behind the general problem of multimedia content deployment is examined. Then, the architectural and technical choices are investigated together with the legal implications to be considered in order to build an effective client/server multimedia content deployment platform suited for health environments.

BACKGROUND

In this section we’ll examine the general motivations behind the development of a multichannel/multimedia content delivery platform (particularly in health environments) and the technological issues lying behind it, detailing important issues such as streaming and communication technologies.

General Motivations

Multimedia content in health environments are typically delivered through scalable, unified, flexible, and expandable health information delivery platforms, with the goal of minimizing overhead, speed integration and cost reduction. A delivery network creates, publishes, and manages an expanding range of health-related content, products,
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