

# Chapter 4

## Multimedia Systems Development

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### ABSTRACT

*The multimedia information system represents a specific form of information system. This research area suffered many changes in direction due to technology shifts. The general problem is that few years back, multimedia technologies had been limited to relatively simple, stand-alone applications, but multimedia systems, particularly Web-based systems grew in complexity and intervened with many critical issues for development. In this chapter, a specific focus will be cast on existing methodology approaches, their upsides and downsides, and on the surveys and research done by distinguished authors in this area on what sort of methodologies are used in practice. Afterwards, the focus of this chapter will be on whether existing development methodologies can be applied to multimedia systems and if there is any need to adapt them for that specific purpose.*

### INTRODUCTION

People have many senses that are used to perceive the world around them. Aside from traditional five senses (sight, hearing, smell, taste, touch) there are others such as kinesthetic or motion sense and vestibular sense commonly known as a sense of balance. As computer technology advances, the means of communication between human and computer broadens to include more

senses. At the beginning interaction was based solely on human sight, by reading the output of rather primitive screens that had low number of colors. Soon another form of interaction included arousing the sense of hearing by using sound as a medium for passing information.

Today's technology advances enables stimulating almost every human sense. Using touch as a form of input as well as for reception of feedback is a part of many widely used mobile

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equipment (Kim, Kim, & Lee, 2007). There are many examples of successful use of sound in human computer interaction, and there was even research in the direction of converting sound to data for the purpose of communication and interpretation (Asrim, Ibrahim, & Hunt, 2006). This is done by the use of the technique called sonification. Efforts to include all human senses in human computer interaction went so far to using scent as a form of communication. It is now possible to purchase off-the shelf, easily controllable hardware for aroma output, and incorporate scent into HCI (Kayem, 2004).

All the scientific and industry achievements cast a completely different perspective to using computer technology. During the 90s of the past century, rapid development of the Internet alongside the development of the processor power, including graphical processors, were the main driving power for the development of multimedia information systems. Advances in multimedia technologies make it possible now for us to provide instant information access to any type of information one desires—text, data, still image, motion picture, and sound (Chen, 1992). The technology served as a tool to enhance the ability of well established procedures people already used multimedia for. Let us take this hypothetical situation for example. If a neurosurgeon suspects a brain tumor in a patient, he completes a set of tomography, magnetic resonance imaging, and positron emission tomography scans of the patients' head (Grosky, 1994). Now, a surgeon can use the power of computer to process the images, use prewritten algorithms to translate the images that were previously digitized and construct the 3D model that would give him a proper insight in where the tumor is, if it is present.

Multimedia information system represents a specific form of information systems. This research area suffered many changes in direction due to technology shifts. This can be seen by simply reviewing what was the standard grasp

of multimedia systems at the initial steps back in 1991: “Multimedia systems are systems enabling the usage of multiple sensory modalities and multiple channels of the same or different modality (for example both ears, both hands, etc.), and as systems enabling one user to perform several tasks at the same time. That is, multimedia is viewed as a multisensory, multichannel, multitasking, and multi-user approach to system design. In addition, multimedia systems put the user in control, i.e. could be described as a user centered approach” (Marmolin, 1991).

Even though most of this definition still applies, we can argue that performing several tasks simultaneously is not reserved for multimedia systems. Additionally, the user centered approach is now a paradigm mostly connected to Human Computer Interaction that is closely connected to MMS but not exclusive.

Right from the very beginning of such systems there is no clear definition or a clear line separating these systems from other information systems. The main problem is that the development in technology constantly influenced the shift in this area. With the invention of World Wide Web and Hypertext Markup Language (HTML), many researchers and professionals linked multimedia informational systems to Web applications. If we put this in the appropriate time frame, it is quite understandable. World Wide Web set a new ground in multimedia. Hyper-linking text, images, and sound was a technological breakthrough in multimedia. However, if we compare a Web application to some other form of multimedia information system such as medical multimedia information system we can acknowledge many differences that are structural, resource wise, and definitely can be identified in development process.

The general problem is that a few years back, multimedia technologies have been limited to relatively simple, stand-alone applications (Barry & Lang, 2003). However, multimedia systems, particularly Web-based systems grew in complex-

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