Chapter 5
Multimedia Support for Native/Embedded Video Playback on Frameworks for RIAs Development

ABSTRACT
Chapter 5 discusses the capabilities of RIA frameworks in the context of multimedia content support. For this purpose, several alternatives for implementing video playback functionality are presented by using both JavaScript-based RIA frameworks and non-JavaScript-based RIA frameworks. Examples of JavaScript-based RIA frameworks having multimedia content support are Dojo, jQuery, Prototype, and Mootools. Examples of non-JavaScript-based RIA frameworks are Adobe Flex™, JavaFX™, Silverlight™, and OpenLaszlo. For each case study the mandatory files are mentioned. The chapter also shows a screenshot where video player is displayed and code snippets that were used are presented. Finally, a comparative analysis of video playback support for each framework is presented in terms of video container formats and encoding types.

1. INTRODUCTION
The possibility to represent graphics, audio, and video is considered an inherent ability of RIAs (Rich Internet Applications). In fact, along with GUI (Graphic User Interface) transformations, visual continuity and temporal behavior, it is a factor affecting one of the distinguishing features of RIAs: the enhanced GUI (Preciado et al., 2005). Hence the importance of evaluating and knowing what frameworks for RIAs development natively support these features.

The present chapter primarily focuses on reviewing the support for video playback on both JavaScript-based and non-JavaScript-based frameworks, because the support for the other types of media, i.e., audio and graphics, is a prerequisite to support video playback.

As is explained in this chapter, most of the non-JavaScript-based frameworks for RIAs development provide support for all the media types...
in a unified way and in terms of GUI controls. However, non-JavaScript-based RIA frameworks provide support for media content in three different ways: 1) by using embedded standard (default) media players, 2) by using own GUI controls and 3) by using <audio> and <video> HTML5-based tags.

From this perspective, this chapter is intended to review the first two aforementioned approaches under the concept that JavaScript-based RIA frameworks do not commonly have video playback support as part of its core. Instead, they provide mechanisms for extending that core (by means of plug-ins or add-ons), so that there be different third-party implementations for video playback support. Therefore, we have considered the third-party plug-ins outlined in (Rosales-Morales et al., 2011).

2. MULTIMEDIA SUPPORT INTO JAVASCRIPT-BASED FRAMEWORKS

Various files formats are used for video playback. Each one of these formats provides certain features. Both the formats and their features are described below:

- **FLV (Flash Video)** is a container file format used to deliver video over the Internet using Adobe Flash Player™ versions 6-10. Flash Video content may also be embedded within SWF (Shockwave Flash) files. There are two different video file formats known as Flash Video: FLV and F4V. The audio and video data within FLV files are encoded in the same way as they are within SWF files. The format has quickly established itself as the format of choice for embedded video on the web. YouTube™, Hulu™, Google Video™, Yahoo Video™, Metacafe™, Reuters™, and many other news providers are examples of websites using Flash video format.

- **MPEG (Moving Picture Experts Group)** is a working group of experts formed by ISO (International Organization for Standardization) and IEC (International Electrotechnical Commission) to set standards for audio and video compression and transmission. MPEG algorithms compress data to form small bits that can be easily transmitted and then decompressed. MPEG achieves its high compression rate by storing only the changes from one frame to another, instead of storing each entire frame. The video information is then encoded using a technique called Discrete Cosine Transform (DCT).

- **RMVB (Real Media Variable Bitrate)** is a variable bitrate extension of the RealMedia™ multimedia compression format developed by RealNetworks™. As opposed to the more common RealMedia™ container – which holds streaming media encoded at a constant bit rate – RMVB file extension, compared with DVDRIP, is typically used for multimedia content locally stored.

- **WMV (Windows Media Video)** is a subset of Microsoft™'s Advanced Systems Format (ASF) container format. WMV files can be played by video players such as MPlayer or Windows™ Media Player™, the latter being only available for Microsoft™ Windows™ and Macintosh™ (Mac™) systems. WMV is a closed source, propriety codec that cannot be manipulated.

In the following sections, the support for video playback for RIAs development is discussed.

2.1. Video Playback Support Using Dojo

Dojo supports video playback by means of the DojoX package. Beyond that, DojoX is a module
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