Cacuriá Multimedia Tool: teachers creating multimedia educational contents

André DAMASCENO¹, Rafael DRUMOND¹, Carlos de Salles SOARES NETO¹,², André MARINS³, Rafael VALLE³

¹UFMA – Federal University of Maranhão, Laboratory of Advanced Web Systems (LAWS) – Av. Dos Portugueses, 1966, Bacanga, 65080-805, São Luís, Maranhão, Brazil. Email: {andre, rafael}@laws.deinf.ufma.br

²UFMA – Federal University of Maranhão, Departamento de Informática (DEINF) – Av. Dos Portugueses, 1966, Bacanga, 65080-805, São Luís, Maranhão, Brazil. Tel: +55 98 33018223, Email: csalles@deinf.ufma.br

³RNP – National Education and Research Network, Rua Lauro Müller, 116, 11th floor, Botafogo, 22290-906, Rio de Janeiro, Brazil. Tel: +55 21 21029660, Fax: +55 21 22793731, Email: {amarins, rafael.valle}@rnp.br

Abstract

The use of supporting materials such as tablets, slides, videos and games in the classroom has become increasingly common, making the learning process more participatory and interactive. A recurring multimedia feature in this context is the use of learning objects or LOs. Wiley (2000) and the IEEE (2012) define learning objects as any entity, digital or not, that can be used, reused or referenced during learning or training supported by computer. However, the development of LOs is an expensive and time-consuming task since it requires a team with experts from different areas (programming, art, design, teachers, etc). The objective of this paper is to present Cacuriá, an authoring tool integrated with an online repository of LOs called iVoD (Interactive Video on Demand), that allows teachers and tutors to create and share videos enriched with interactive multimedia content. Figure 1 describes the architecture of the proposed service. First a teacher must create a LO using Cacuriá and then submit it to the cloud storage. Then, students can watch and interact with the content created by the tutor using devices with Internet access, such as tablets, computers and smartphones. This is an ongoing project funded and accompanied by RNP, the Brazilian NREN, in the context of the Videos on Demand as Learning Objects Working Group (GT-VoA).

Figure 1 Architecture of the iVoD Service.

The current version of the Cacuriá tool consists of six different views used to manipulate the media as we can see in Figure 1. Menu View (1) is used to add media and to publish the LO. Scene View (2) is used to add, remove and sort the scenes, as well as to indicate what scene is in focus. It is also possible to create automatic links between scenes, allowing one scene to be started automatically at the end of a previously one. Layout View (3) is used to visualize the positioning and sizing of the media according to time. Time View (4) is used to run and manipulate the time of a scene. Properties View (5) is used to view
and edit the properties of the media in focus. Vision Library (6) is used to list the media of the project and the current scene.

![Image](185x548.png)

Figure 2 Layout of Cacuriá authoring tool.

The approach used in the tool is WYSIWYG (What You See Is What You Get), in which the content on the screen that is being modified is identical to the final application generated by the tool. Thus, using this tool does not require prior knowledge about details of the specification language for developing interactive applications in order to use it. This turns out to be particularly useful to ordinary users that does not have specific programming skills but are interested in producing LOs. Cacuriá can also be used by the casual user who does not want or have time to learn a programming language or technology for that purpose only.

The tool has an internal processing module responsible for converting Cacuriá applications into NCL code (Nested Context Language) or HTML5. NCL is the programming language adopted by the ISDB-Tb (International Services for Digital Broadcast, terrestrial US) for interactive digital TV applications in the declarative part of its middleware Ginga, as well as the ITU-T (International Telecommunication Union) recommended it for IPTV services. HTML 5 is the markup language for structuring and presenting content for the World Wide Web, which allows the implementation of LOs produced in Cacuriá in the Web.

Keywords
Multimedia Authoring, Learning Objects, Distance Learning.

References

Biographies

André Damasceno is a master’s student in computer science and a researcher at the Laboratory of Advanced Web Systems (LAWS) at the Federal University of Maranhão, Brazil. His research interests include multimedia systems, digital television, and distance learning. André has a BS in computer science from the Federal University of Maranhão, Brazil.
Rafael Drumond is an undergrad student in computer science and a researcher at the Laboratory of Advanced Web Systems (LAWS) at the Federal University of Maranhão, Brazil. His research interests include multimedia systems, digital entertainment, serious games, and games technology.

Carlos de Salles Soares Neto is an associate professor and the coordinator of the Laboratory of Advanced Web Systems (LAWS) at the Federal University of Maranhão, Brazil. His research interests include multimedia systems, hypermedia, Digital TV, distance learning, serious games, distributed multimedia applications, and computer networks and video. Soares Neto has a PhD in computer science from the Catholic University of Rio de Janeiro, Brazil.


Rafael Valle is Coordinator of Research and Development at RNP. Rafael has graduation and M.S. degrees in Telecomunications Engineering at Federal Fluminense University (UFF) in 2008 and 2011, respectively. He works at RNP since 2011 and currently has been coordinating R&D projects involving advanced internet, wireless networks, dynamic circuits, video applications and accessibility.