

# Music Management in the Digital Age

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## INTRODUCTION

Nowadays, the existence of a single global interface, which interconnects the music world, is a fact: the Internet itself acts as a huge jukebox, containing a huge volume of musical data of all kinds, and is accessible by anybody. YouTube, social networks, digital music libraries, file sharing systems, and recently cloud computing push the coexistence and massive distribution of all kinds of music. Music cultures and traditions intermingle because of the free music distribution and the Web's globalization.

Music information management has reached a new level lately. The user is not exclusively based on media sites in order to acquire music files and information. The plain articles and the inflexible structures have been replaced by the newly offered interactive options of Web 2.0. Users can now easily read comments and reviews by other users, post their own comments, download or just listen to a music piece. All these capabilities make the user part of a continuously evolving community.

The proposed article explores the ways that current users adopt in order to manage the huge volume of available music information. The key attributes of music management systems will be presented taking into account the leading commercial music library of the Web: YouTube. Moreover, issues on music files management and concerns about proper music management in the Internet will be discussed.

## BACKGROUND

The way people treat music in our days has totally changed as a result of the current developments in hardware and software, as well as the evolution of the Internet. People do not buy CDs or records anymore.

Nowadays, people store music data on their disks and listen to music via portable devices (i-pods, mobile phones etc.). Moreover, the advent of Web 2.0 has brought colossal changes in the field of music management. In the digital age, there is a turn from the established MP3 format to the online streaming of music and video clips. Social networks and the solution of cloud computing, which do not require storing data in disks, are the new trends in music consumption and distribution. All these changes create new issues and force the necessity for innovative ways of digital music management.

The emerging form of the Internet and the WWW is known by the term "Web 2.0." The former structure (now known as "Web 1.0") was primarily based on passive access to content that someone else (usually a professional) had created and published. The current trend facilitates the creation, assimilation and distribution of information and knowledge. There is a clear separation between highly popular Web 2.0 sites and the "old Web." Three kinds of shifts can be distinguished:

- **Technological:** Scripting and presentation technologies used to render the site and allow user interaction,
- **Structural:** Purpose and layout of the site, and
- **Sociological:** Notions of friends and groups (Cormode & Krishnamurthy, 2008).

At a technical level, Web 2.0 is based on small chunks of information, loosely interconnected through a range of standards and web services. Web 2.0 is blurring the boundaries, allowing consumers to be themselves the producers (Knowles, 2007).

The development of new hardware solutions also plays a crucial role in the aforementioned multimedia manipulation of Web 2.0. Portable devices are the

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state-of-the-art media for producing, reproducing and delivering multimedia data over the web in an “anywhere - anytime” manner. Average users own generic devices, such as mobile telephones, PDAs, portable computers and tablet PCs. These days, mostly entertainment devices (MP3 players, iPods, portable video game consoles etc.) deal with communicative and multimedia operations and have the same capabilities as personal computers (e.g. Internet connectivity, high quality graphics, etc.). The case of the mobile phone is typical.

Focusing explicitly on music, there is yet a number of solutions utilizing multimedia and Web 2.0 for the sale, playing and promotion of digital music files. Apart from general music software solutions, even operating systems give great emphasis on the multimedia web management in our days. Google Chrome OS is the new Google’s operating system, which is mainly Internet-oriented.

The main fact behind the philosophy of this operating system is that there is a great amount of people that use their PC exclusively to connect to the Internet. Furthermore, Internet offers so many different options (social networks, videos, e-mail, chat, music) that qualify our browser as one of the most important software parts in our PC. Google’s general intent is to create an operating system as similar to a web browser (much more so Chrome). This has led to the new operating system, which lacks of several functions of a traditional operating system that slowed down the actual online needs of a web user.

Users of Google Chrome OS are not supposed to store anything in their hard disks, since all the information will lie on the web and only web applications will be used. Google is based on the motto “everything in the web” and therefore our music information will also lie there. If a user wants to listen to a piece of music, he will have to browse the web, search for it and listen to the song directly from a web source, e.g. YouTube. The creation and uploading of a streaming playlist on a web server will also be a possible option to listen to our favourite music online.

“Everything in the web” is also the main idea behind *cloud computing*. Cloud computing refers to the use of computing power, which is spatially located in a “cloud” of remote networks. Cloud computing means large data centers, which offer economies of scale, cheaper computing power and most importantly, flexibility to pay for only what you use.

As far as cloud computing for digital music is concerned, there is no need to store music files on hard disks and flash disks. Music files are stored in a “cloud” of servers distributed around the world, while the network devices gain access to music collections wirelessly from remote servers. Through cloud computing, digital stores such as iTunes, can offer unlimited access to millions of songs with a monthly subscription.

Cloud computing offers a range of advantages (Mirashe & Kalyankar, 2010):

- **Optimal use of Resources:** Cloud computing reduces costs and maximizes usability since resources are only available when required.
- **Flexibility:** There is no risk for information loss since all systems and software applications remain constantly available.
- **Access from Everywhere:** Cloud computing enables access to applications and data from anywhere in the world, safely encrypted through Internet.
- **Cooperation:** Having the applications and data accessible from the cloud, collaboration between people becomes easier since users can work simultaneously on the same project.
- **Disaster Recovery:** Disaster recovery procedures can be automated via cloud computing by using backup and maintaining servers, especially designed to act as images of the main servers.

Among the great companies, which work on cloud computing software for digital music distribution over the Internet are: *Google, Amazon, Apple, Microsoft, Salesforce.com, Dropbox, SugarSync* and *Box.net*.

Because of this turn towards online music, there is a huge volume of music available in the web. One of the crucial issues (from the beginning of digital music evolution back at the age of Napster) is *music compression*. The most popular compression technique for audio files is the MP3 algorithm (MPEG-1 Audio Layer III). MP3 files used to be listened to mostly using PCs and portable devices. Apart from this lossy codec, most of the online services for streaming or downloading have adopted other codecs, such as AAC (Apple) or Ogg Vorbis.

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