Cross Media Digital Rights Management for Online Stores

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Abstract

Digital music consumers have to choose between illegal file swapping services and online music stores. The latter impose various restrictions to the established music consumption behaviour, such as limitations on the number of devices and proprietary music formats. We describe a business model that is based on a liberal management of music rights, instead of the dominant restrictions of access. The proposed business model facilitates the free flow of music content between different client devices (PC, mobile phone, portable player) and between heterogeneous networks (Web, P2P, wireless, broadcast), but it controls the flow of rights for added value music bundles. The business model is presented over two stages of the customer activity cycle and along the revenue, process and technology elements.

1 Introduction

In recent years there has been a proliferation of online music stores, which are targeting the consumers who have switched to digital libraries for managing their music collections. At the same time, consumers are downloading songs and sharing their music collections through many devices and networks. As a countermeasure, the music industry has been implementing Digital Rights Management (DRM) systems, which control the access to digital content [5]. In this disruptive technology environment, which is a viable business model for online music stores?

In our view, such a business model should create revenue for the music industry by competing directly with P2P networks and creating additional value for the consumers. We describe a business model that holds these two properties by analyzing two of the fundamental activities of the music consumption experience [3], [9]: 1) music discovery and 2) music purchase. In Section 2, we analyze the current business models employed by the popular online music stores. In Section 3, we describe our methodology and propose a new business model for cross media distribution of digital music. Finally, in Section 4, we provide suggestions for the music industry and recommendations for further research.

2 Current Business Models for Digital Music Distribution

The analysis of the current business model for the online music stores is focused on three basic elements: 1) pricing, 2) distribution of content and 3) rights. There is a proliferation of online music stores, but the underlying pricing schemes are two: 1) A-la-carte downloads, pioneered by the Apple iTunes Store, and 2) Subscription services, such as RealNetworks Rhapsody. Content distribution is either file downloads or music streaming. DRM rules usually prescribe the number and type of devices a music file may be played on, and the number of CDR burns. Next, we present how these elements have been implemented in today's popular online music stores. In particular, we investigate how these basic elements are defining the online music consumption experience over two fundamental activities: 1) music discovery and 2) music purchase.

Apple is using its own proprietary DRM format (FairPlay), in order to keep the control of the whole value chain of the music file from its online store, through its software player, down to its portable player. The consequence of this decision is that a music file purchased at the iTunes Store will only play on a FairPlay decoding system — so far Apple is not licensing its system. If a consumer decides to switch from the iTunes, or the iPod to a different player, then the entire music collection bought through the iTunes Store becomes obsolete. The music files in the iTunes Store are centrally stored. Overall, the Apple iTunes Store offers a competitive low purchase price, but restrictive and "punishing" DRM. Play-list uploading and user ratings are employed as a centrally managed

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scheme for music discovery. In addition, store visits have free streaming of short music samples (thirty seconds), which is only suitable for a basic discovery experience.

On the other hand, the primary pricing strategy for the Rhapsody service is the subscription. The consumers pay a flat-fee monthly subscription in exchange for unlimited access to the whole music library. The store is also offering complementary a-la-carte downloads for the music files (encoded and protected with the RealAudio technology) that consumers wish to carry with them in portable players. Accordingly, the content distribution is based on streaming of music files from central servers and the DRM format is a proprietary system of RealNetworks. In the case of canceling a subscription, consumers do not own any music besides the a-la-carte downloads.

Overall, the RealNetworks Rhapsody service offers the benefit of affordable music discovery, with the option of buying music files for portable devices, or for keeping them in a personal collection. Nevertheless, consumers are locked into a proprietary music format and into a specific software player, which is used for the streaming.

In summary, existing online music stores employ a monolithic file format (i.e. fixed bit rate) and centralized architecture for the distribution of digital music files. The monolithic file format means that a music file is usually suitable only for reproduction on a personal computer system and as a matter of fact it does not consider the need to play the music on hi-fi systems (high bit rates), portable players and mobile phones (low bit rates). In addition, many online music stores use proprietary file formats and DRM systems, which locks the consumer into specific hardware and software music players.

The use of a centralized architecture for the distribution of music files means that the size and the variety of the music collection depends on the ability of the online store to sign contracts with the copyright holders. The consequence is that big labels and mainstream artists are well represented in one-off deals, but independent artists and small labels do not have a good representation. Finally, online music file pricing is arbitrary and is done on the basis of the offline CD price, in order to avoid channel cannibalization [2].

In short, today's online music stores face the following issues:

- Inflexible pricing structure
- Lack of size and variety of music collection
- Monolithic file formats and proprietary DRM

3 Consumer Behavior and Digital Music Distribution

The presentation of a new business model for online music stores is performed over two music consumption activities (discovery and purchase of music) and along three elements (revenue, process, technology) of the generic business model framework [1]. The description of each element treats the issues faced by the contemporary online music stores, as identified in the previous section (pricing, distribution, rights). The discovery and purchase of music are two notions of vital importance to online music service managers (Figure 1), since they correspond to two (pre- and during-) of the three steps in the customer activity cycle model [8]. The third step (post-) corresponds to the music listening activity (e.g. browsing, arranging play-lists) and will be treated in further research.

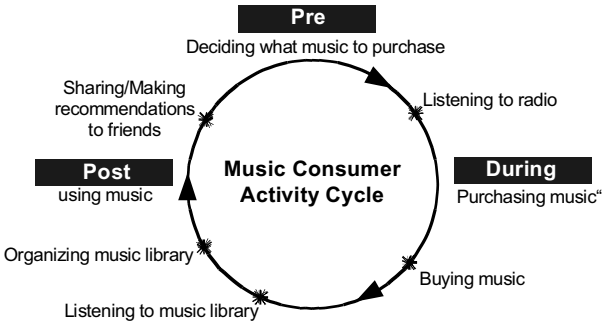

Figure 1: The customer activity cycle adapted to the music consumer (modified from [8])

3.1 Discovery of Music

Traditionally, the discovery of new music is done through many alternative sources, such as radio, friends, magazines, live performances and music stores. The main characteristic of music discovery is that the subjective value of a music song can only be assessed after it has been listened to a few times, since music is an experience good [6]. Therefore, for the discovery of new music there shouldn't be any strong requirement for direct monetary compensation to the copyright owner. Yet, there are many opportunities for indirect compensation, such as advertising and subscription. In particular, radio is a very popular medium for the dissemination of new music and the recent emergence of podcasts supports the radio paradigm for music discovery. Next, we describe how the radio paradigm may be transferred to the e-business world of online music stores.

Revenue: Broadcast radio is supported by advertising and/or subscription. Taking the example of radio to the P2P area, one obvious business

requirement is to have P2P networks that are supported by advertising and/or subscription. The P2P networks should then pay license fees to the collecting societies. Alternatively, a levy may be imposed to consumers of broadband services through internet service providers [7].

Process: The user employs a P2P client, which has a favorite list of other users and their play-lists (e.g. radio producers have play-lists that change slowly over time). The user selects and streams a play-list, but the user does not have the right to store the music locally. Moreover, while the user listens to music the P2P client is searching in real-time for music that is similar to the one the user is listening to. It would be a conflict of interest to have the online music store acting as a recommender, because the recommending might be adjusted in favor of new items instead of the ones already purchased.

Technology: The shared play-list functionality is already implemented in the iTunes player for LANs (Shared Music folder). It is also centrally implemented (songs can't be streamed) in the iTunes Store (iMix). The digital music player should include a P2P client, which features recommendations, trust and reputation mechanisms, in order to filter music files and deliver new music files from P2P networks. The music recommendation system should have granularity, in terms of the data-set used: 1) current play-list, 2) previous consumption behavior and 3) entire music library. Most of the current recommendation systems are based only on the latter.

3.2 Purchase of Music

Traditionally, the purchase of new music is done through music stores in the form of CDs. The music CD has two characteristics: 1) it is a bundle of music songs and 2) it is exclusive to its owner. Both of these attributes have been broken by the availability of digital music on P2P networks. Moreover, consumers are expecting to transfer music to portable devices, car stereos and to share music with friends. Next, we describe how the established music consumer experience can be transferred to the e-business world of online music stores.

Revenue: Once a music song is assessed then consumers may want to buy a reasonably priced license to it. Assuming the existence of easily accessible P2P networks, consumers would only want to financially compensate for music in exchange for a better service, when compared with alternatives. Better service for music content means that besides the music file, the consumer should receive additional benefits, such as mobile phone ring-tones, cover-art, music videos, commissions for successful recommendations to friends [4], concert tickets when buying the whole album, etc. In brief, there should be some significant benefit for paying to acquire music content, or otherwise the consumer may just download it illegally. In this scheme, online music stores compete on price, bundles and services, but share an interoperable technological platform.

Process: The user employs an integrated digital music player and music storefront such as iTunes. The storefront is used for the clearance of the rights that the user wants to purchase a license for. Purchasing a license adds value to the basic music file by bundling it with complementary services —such as ring-tones and earning commissions when friends purchase similar bundles. There may be a granularity of levels in the friend's network of a specific user. For example, a small circle of close friends may have immediate access to the song, but not the whole package of services that accompany a legitimate license of the music. More distant circles of friends may have only streaming access through play-lists, as described in the music discovery use case.

Technology: The storefront is built using web technology so that it is accessible from any device with an integrated HTTP protocol and HTML rendering engine (e.g. Music player, mobile player, Web browser, etc.). The purchase of the license is made through a central authority that manages the copyright for the artist. The music-bundle is packaged with an MPEG open standard (e.g. MPEG 21). Under the above scheme a music song may take many alternative paths before arriving at a user's digital music library (e.g. broadcast, internet, CD ripping, mobile, etc). On the other hand, licenses are centrally managed and issued.

3.3 Suggestions for Online Music Stores

It has been suggested that the rights of a file should be traded independently of the file itself [5]. The license for the music may be acquired from an online clearance system operated by a big label, by a coalition of smaller independent labels, or by an individual artist. Under this scheme, online music stores are competing in terms of price, music bundles and additional services (e.g. recommendations based on mood metadata). The integration of storefront and license clearance is not recommended, since it may create anti-competitive lock-in to one DRM system and it would certainly create inconvenience for the consumer, because of incompatibility.

Moreover, the DRM system should be agnostic in terms of the source of the music file. The music file may arrive through many alternative routes that facilitate the established music consumption experience: 1) Purchased online or offline (and ripped from a CD), 2) downloaded from a P2P network, 3)

copied form a portable player or a home media gateway, 4) downloaded from a wireless service provider, etc. The payments should be made in exchange for the rights to a bundle of music services. Assuming the wide availability of music files for free, a possible incentive for buying the rights for particular music content should be to gain access to a competitive bundle of services, such as high-fidelity versions of the song, ring-tones for mobile phones, cover art, DJ versions, mood meta-data etc.

In this context, the objective of the DRM system is not to restrict access, which is the current practice, but to enable more access to the legitimate license holders.

	Discovery	**Purchase**
Pricing	Subscription Advertising	Online economics (low pricing)
Distribution	P2P	Centralized license server
Rights	No DRM	DRM

Table 1: Business model suggestions for online music stores

Overall (Table 1), the suggested business model is agnostic in terms of the network and device used to access a music file, but it regulates the flow of rights between the users. In this sense, the flow of rights is an important element that should be considered in the description of e-Business models — at least in the cases when rights are transferred between users.

4 Further Research

The proposed business model does not regard the consumers as potential thieves and instead of locking them into proprietary digital music platforms, it offers a protected music bundle that has increased value when compared with the music available on the P2P networks. In the medium term, we expect that no single business model will dominate the marketplace, since there are always many alternative (and many of them offline) offers for each of the basic music consumption activities. In this sense, online music stores should not be myopic, in terms of the possible places, where the music activity takes place. Instead, they should acknowledge the serendipity of the discovery and the alternative sources for the purchase of music.

In addition to the traditional content and payment flows, we discussed the element "flow of rights" that enables an additional level of analysis for e-business models. Further research should validate the flow of rights in other areas of e-Business models, besides the online music stores. Further empirical work will provide an implementation of the proposed business model in a DRM system. We also plan to investigate the implications of the music listening activity (which is the third step in the music consumer activity circle, in addition to the discovery and purchase activities).

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