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# PERSONALIZED PREVIEWS: AN ALTERNATIVE CONCEPT OF VIRTUAL GOODS MARKETING

[http://virtualgoods.tu-ilmenau.de/2004/personalized\\_previews.doc](http://virtualgoods.tu-ilmenau.de/2004/personalized_previews.doc)

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**Abstract:** Until now, many responses to the digital dilemma have been focusing on law, and on technology preventing unauthorized copying and usage. However, only businesses that take into account often-ignored factors such as norms and economic aspects, and copyright's rationale, will be successful. While considering these aspects, the following paper describes a technological approach to exploit the positive effects of consumer copying, while eliminating its negative effects at the same time. Personalized previews create incentives for users to give away lower-value versions of the content instead of the purchased original. They represent a marketing instrument that can benefit both media industry and consumers, and can help to do without technical protection. The paper gives an overview of the approach and possible applications, and discusses some of the technical questions involved.

## Introduction

The advent of advanced technologies for digitization and compression, and the widespread availability of PCs and broadband networks offer an abundance of online business opportunities. They have greatly enhanced the way we produce, distribute, and consume digital goods. But the new technologies also represent difficult challenges often referred to as the *digital dilemma*: While traditional copyright has always been relying on natural limitations to copying, barriers to copyright infringement that existed in the analogue domain have been eroded. Now, copying means perfect replica at virtually no cost, and communication allows for the global sharing of copies.

With Napster et al, the most spectacular conflicts resulting from this have hit the music industry. Until now, significant parts of the industry, with help from parts of the legislation, have been favouring *information feudalism*, a school of thought that seeks to reinstate alleged absolute property rights by means of technology. Consequently, the strategy has been focusing on law suits, an extension of copyright law, and the use of Digital Rights Management (DRM) technology for enforcement. It is supplemented by the assumption that as for DRM, only total control over content is helpful, because anything less will leave loopholes, and will therefore not suffice to solve the problem.

But that strategy has failed: Instead of being able to benefit from the new business opportunities, the industry is still suffering from the very same problems. The situation has indeed become worse due to an increasing gap between industry and consumers.

There are many reasons for the strategy's failure. One of them is the intended or unintended misunderstanding of copyright's rationale, which was one of the things we discussed in an earlier paper:<sup>1</sup> Copyright is neither about absolute property right nor about total control over content, but is designed to promote the public good, and represents a delicate balance between the interests of rights holders and the public. It creates incentives for creative production by granting monopolies, but at the same time includes vital limitations such as fair use and consumer copying. DRM systems must address fair use and other limitations, if their purpose is to protect copyright, and if they want to be accepted by consumers and the public.

### **Incentives, norms, and the market**

Another serious drawback of the industry's strategy is the exclusive focus on law, and on using technology in order to enforce it, while ignoring other important factors. Anyway, does the term "rights", which is stressed in most discussions about the digital dilemma, grasp the core of the problem? Do people produce, distribute, or consume creative goods because of rights? They do because they have incentives for doing it, or do not because of the absence of such incentives. After all, copyright's objective is to make a market work, and by introducing rights it creates incentives in order to reach that objective. We have therefore argued that thinking in terms of *incentives* is a much more appropriate approach to enable business than thinking only in terms of law or technology.

Industry's strategy, as mentioned above, tends to underestimate or even ignore two extremely important factors apart from law and technology: *norms* (social, psychological and ethical aspects), and of course *market* (economic aspects).<sup>2</sup>

*Norms* can be a powerful force that makes people purchase content, but they can also become a powerful force that keeps people from doing just that. Many consumers have a strong sense of admiration and loyalty towards the artist, and norms create an awareness that the artist should be paid for his work. Therefore, norms tend to promote incentives to buy. However, this mechanism cannot be taken for granted: loyalty towards the artist is one, but loyalty towards the industry marketing the artist's work is quite another thing. From the consumer's point of view, the media industry is just a means to "communicate" with the artist, not much more. As long as consumers think that the industry does a good job, everything is fine. But if they perceive the industry as an obstacle between artist and themselves, the positive role of norms ceases.

The problem is that the industry and consumers have ended up in something that is rather a battlefield than a good relationship. Because DRM systems tend to favour right holders' interests at the expense of the public and the idea of copyright, they create a credibility gap for both technology and industry. Many consumers doubt that the industry acts the interests of the artist at all, which serves as a convenient excuse for them not to pay for what they enjoy.

As for *market* factors, online sales of content of course depend on whether there is reasonable value for the price or not: A bigger selection, a better content quality, more user-friendliness and less usage restrictions create a higher value. Of course, there are many more, and new, possibilities to create value by offering new services, for instance with respect to metadata, user matching, and content retrieval.

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<sup>1</sup> See AICHROTH, P.; HASSELBACH, J. (2003).

<sup>2</sup> The identification of four regulators, *architecture* (technical aspects in the broadest sense), *market*, *norms*, and *law* has been introduced by Lawrence Lessig. See LESSIG L. (1999).

Of course, only legal online businesses that manage to offer reasonable value for the price are successful. One, and until now by far the most successful example is Apple's iTunes music store. It offers a reasonable combination of affordable prices, user-friendliness, and a non-obtrusive DRM with comparatively few restrictions.<sup>3</sup> With respect to norms, it is again important to note their positive impact: Apple manages to benefit from the attitude of their Mac users, and from the company's image of being independent and known for fair play. In that context, it is interesting to see that although Apple's DRM system has been hacked, this does not seem to do any harm to their business: Within a year, Apple has sold 70 million songs, and the company now accounts for 70% of legal music downloads from the Internet.<sup>4</sup>

However, there are not many examples of that kind. Too much effort has been put in technology that prevents people from accessing and using content, thus substantially lowering content value from a consumer's point of view. The same effort would probably as being as much more efficient when put into attractive new services and businesses instead. While it is true that the digital era comes with many problems, it comes with even more possibilities and business opportunities. It is questionable whether it makes sense to spend so much time with disabling, while most enabling possibilities are still unexploited. After all, they will be the key.

### **About the ambivalence of consumer copying**

One of the most controversial issues in the discussion about DRM technology and the digital dilemma is *consumer copying*. Copyright law has traditionally supported consumer copying, but is not very clear about its extent. It can be argued that copyright aims at avoiding the kind of copying that causes so much economic harm that it threatens the artist's incentives. But opinions on this vary enormously: While some insist that any kind of copying is causing enormous harm, others doubt that there is any correlation between copying and CD/online sales at all.<sup>5</sup>

A distinction between *personal copying* and *public dissemination* is helpful. Fraunhofer's LWDRM System<sup>6</sup>, for instance, is based on traceability instead of access control, and does not prevent personal copying, but concentrates on public dissemination. The economic idea behind it is the following: If there is any copying that has the potential to cause great economic harm, it is the public dissemination of high quality replica to an anonymous public. In contrast, making a personal copy for your car, or even for a friend, does not represent a major threat to be addressed.

Copyright law has traditionally allowed non-commercial copying within the concept of fair use. Apart from that, the perfect control of copying comes at a very high price, not only in terms of developing a complex technology, but also in terms of lowering the content's value and upsetting the customers. Less obtrusive systems or even extremely simple mechanisms that discourage copying can be more effective, because they are less complex, and more user-friendly.

The basic idea behind the approach proposed herein, however, stems from a different, incentive-oriented view on the subject of copying: *Consumer copying represents a powerful means of promoting content* and boosting content sales. Users know about

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<sup>3</sup> The content is always bound to a machine, but apart from this there are no usage restrictions. Moreover, Apples *FairPlay* DRM allows five active machines at any given time, and supports CD burning.

<sup>4</sup> See *iTunes Download 70th Million Song* (May 07, 2004)

<sup>5</sup> See RÖTZER, F. (2003).

<sup>6</sup> Light Weight Digital Rights Management. See NEUBAUER C., BRANDENBURG K., SIEBENHAAR F. (2002).

their friend's taste better than anyone else. They can spread "the news" much more precise, unobtrusive and effective than any promotion campaign ever could. If negative effects of consumer copying were eliminated, we would have a great marketing tool.

## **Previews: Idea and Overview**

Consumer copying only becomes a problem when there are no incentives to purchase the "original" version of the content anymore. When a user has received a copy of a song that he likes, he is probably still willing to purchase the same song if the additional value of the original justifies the price: Having received an MP3 file from a friend, the user might still want to buy the original on CD because of its superior sound quality, or because he simply prefers to possess something in its physical form. Having received the copy of a CD, he might still want to buy the original because of the booklet, or because he simply feels bad without paying for it.

Assuming an existing business with original content of a given value (determined by the interaction of norms, market, law, and technology), technology can be used in order to make sure that there is an incentive to buy the original: by decreasing the quality of and/or cutting the original, a lower-value version is generated - a *preview*.

But a user cannot be expected to enthusiastically distribute such a preview to his friends: While being willing to promote, he does not have any reason to stop giving away perfect copies. In order to create an incentive for him to become a preview promoter, he must be rewarded for doing that, i.e. he needs to be offered a reward or credits. In order to enable that, user references need to be attached to the preview, which can be used for accounting later.

Moreover, the user must be able to bring in creative ideas. The generation process should therefore support e.g. the addition of personal comments, reviews, lyrics, artwork, biographies, photos, discographies, websites and purchase URL etc. It should also support some user control about the level and the means of degradation, e.g. about the cutting.

By adding user references and user-created information/data to the preview, a *personalized preview* is created. In the following, we will also use the equivalent term *myPreview*.

Until now, a recipient of a myPreview who is willing to buy the original will have to download it. Despite having already parts of the content, all data of the original version will have to be transferred after purchase. While using such a *small preview* is sufficient in many cases, there is another option: *big previews* do already carry all data of the original, but in a partially encrypted form. After purchase, only a key needs to be transferred in order to decrypt and restore the full value version.

The overall concept can be divided into two parts, which describe what happens on the sender's and on the recipient's side.

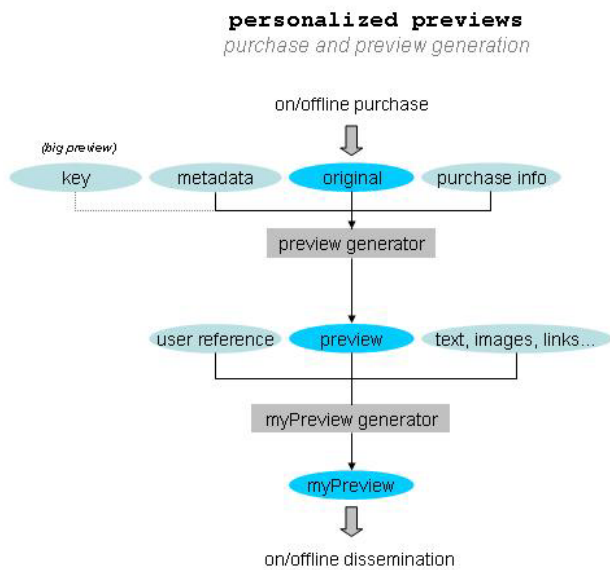


Figure 1 – Preview/myPreview generation and dissemination

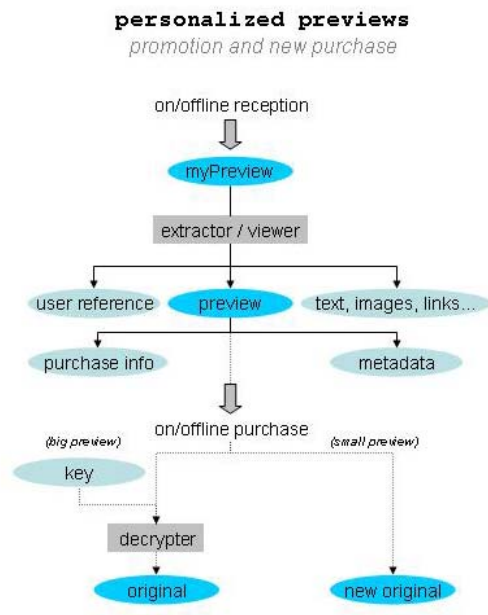


Figure 2 – MyPreview evaluation and new purchase

Fig. 1 shows a description of the first, where personalized previews are generated in order to be disseminated:<sup>7</sup>

- *Preview Generation:* After purchase, a preview is derived from the original version of the content. Moreover, corresponding metadata and the information needed for a new purchase are added. Both steps, which may be taken either by the consumer or on a server, will be realised with a preview generator that uses cutting and/or quality degradation. In case of generating *big previews*, the higher-value parts of the content are encrypted with a key.
- *Referencing and Customization:* The prospective promoter adds custom-made information and data to the preview. And, most important, user-references are attached. These steps are resulting in a personalized preview.

Now, all necessary information is included and the personalized preview is ready for dissemination. As the amount of data will be comparatively small (in case of small previews), many distribution channels, no matter whether online or offline, may be used for the transfer to friends or the public: (wireless) networks, CD/DVD, USB stick, Organizer, cell phone – you name it.

Fig. 2 is a description of the recipient's side, where myPreviews are evaluated and (possibly) a new purchase is made:

- The recipient uses a standalone application, or e.g. a plug-in for popular media players, in order to extract and view/render all interesting information: the promoter's custom-made information, content metadata and of course the preview itself. Using the purchase info, the recipient can establish a server contact in order to purchase the original version or find out about the terms of purchase.
- In case of purchase, the user reference is transmitted, thus allowing the server to assign the corresponding reward to the successful promoter. It is noteworthy that the purchase may also take place offline: Then, the user reference is given to the

<sup>7</sup> The figures show only one possible implementation. Of course, many points are subject to change.

shop, the task of which is to transmit the information to the server. In such cases where purchasers have to take extra steps, e.g. present a code, a reward should not only be granted for the promoter, but for the buyer as well.

- If the purchase has been triggered with a small preview, a new original version is now downloaded. In case of a big preview, however, only the corresponding key is transferred from the server, and then used for decryption and restoring the original version.

Now that the recipient has turned into a new purchaser, he might decide to become a promoter himself. If that is the case, the whole process starts over again.

As for rewards, myPreviews are agnostic: They do not imply a distinct kind of reward and support lots of possibilities: a fraction of subsequent purchases, privileged access to tickets et al, contact to artists, promotion contests with rewards, rebates on new purchases, or other gratifications that have nothing to do at all with the context of the digital good.

Obviously, the use of credits and account management would be particularly flexible instruments. In that case, multilevel rewards would also be possible, creating an incentive not only to promote, but to be a pioneer in promoting. This would be particularly interesting for new releases and newcomers.

## **Audio previews: some technical issues**

Although all kinds of content apply for myPreviews, the following refers only to the example of audio content.

### **Degradation and cutting**

Technically, content can be degraded either by affecting quality or quantity. In the case of audio, quality degradation could e.g. be done by reducing the bit rate / bandwidth, by reducing the number of channels, or by inserting synthetic or natural speech or sounds into the audio material. As for quantity, cutting may be applied, either manually, or with the help of audio segmentation algorithms.<sup>8</sup>

Determining the optimal value for previews is a crucial point for the whole concept. On one hand, the degradation has to be substantial enough to justify the price for purchasing the original. On the other hand, however, the generated preview still needs to be valuable enough to catch interest. A good starting point for finding that value could be somewhere near to what cheap analogue audiotape copies offer: The way audio taping and CDs coexisted for many years actually seems to be a good example of how the interests of industry and consumers can be balanced and therefore represents a good analogy to myPreviews. 30-second low quality clips like the ones offered by many online retailers and portals today will probably not be valuable enough to catch anyone's interest.

It is clear that reasonable conditions and technical parameters for finding adequate values have to be negotiated with rights holders, and e.g. collective societies.

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<sup>8</sup> Audio segmentation algorithms use signal features in order to detect musical segments.

## Formats and codecs

For audio content, standardized file formats and codecs (e.g. MPEG-1/2, MPEG-4, MP3, AAC, etc.<sup>9</sup>) are utilized to achieve higher acceptance with users and software developers.

In case of big previews, methods are needed that allow for an encryption of higher-value parts of the content while not affecting the lower-value parts. At least two approaches seem applicable:

- Fraunhofer's AudioScrambling technology<sup>10</sup> operates directly on the AAC or MP3 bit stream instead of protecting entire data blocks. As a result, decoding a protected bit stream without the proper key produces a distorted audio signal. This is also a pretty secure approach, since substantiated knowledge of the bit stream structure is needed to reach the protected parts.
- Hierarchical Coding, e.g. within MPEG-4 AAC<sup>11</sup>, allows for a basic audio quality to be delivered by one audio layer, while the quality can be extended adding one (or more) layers of additional coding information. That means: If encryption is applied to the extension layer(s), basic quality is always delivered, while full quality can only be enjoyed with the proper key.

As for the placement of data with the audio file, several options cross one's mind:

- Content metadata may e.g. be placed using ID3v2-tags for both MP3 and MPEG-4, while for the latter various tagging methods, e.g. iTunes tagging, could be used.
- Purchase info and user reference etc. may e.g. be placed within ancillary data (MP3) / atoms (MPEG-4), or possibly embedded using audio watermarking<sup>12</sup>.
- All the user-created data for the purpose of promotion may e.g. be transported within ancillary data / atoms. Or it is put in a separate container/file, only the reference to which is placed within ancillary data / atoms.

## Content identification and data authentication

For generating and using myPreviews, it is necessary to identify content and authenticate data, i.e. ascertain its origin and integrity. Fingerprinting, audio fingerprinting<sup>13</sup> and cryptographic methods such as digital signing will be used for that purpose. In order to ensure that rewards are accounted correctly, it is for instance necessary to authenticate user references, which could be done by means of a server signature. Or the integrity of a preview can be validated by comparing its hash with hashes stored in the server database at purchase time.

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<sup>9</sup> See *Fraunhofer IIS - Audio & Multimedia - Home of Layer 3 and AAC*.

<sup>10</sup> See *Fraunhofer IIS - Audio & Multimedia - Audio Scrambler*.

<sup>11</sup> See *Fraunhofer IIS - Audio & Multimedia - MPEG-4 Scalable Audio Profile*.

<sup>12</sup> See *Fraunhofer IIS - Audio & Multimedia - Watermarking*.

<sup>13</sup> See *Fraunhofer-Institut für Digitale Medientechnologie IDMT (AudioID)*.

## Server and client-server communication

As for client-server communication, the use of Web Services seems a reasonable approach, as does the use of Secure Socket Layer (SSL) connections for at least certain parts of the communication.

Each shop working with myPreviews might perform all necessary server tasks on its own, e.g. the registration and authentication of users, or assign rewards. But having a centralized preview service that performs the main tasks is also an option. There would be quite a few advantages:

- Central user and certificate management, users would only have to register once
- Only a single interface for users to communicate with
- Easier handling of global content IDs, keys, purchase info and other information used
- Central accounting of rewards: all reward information would be in one place
- Several shops could share a common pool for rewards
- Easier integration of myPreviews into existing shops

## Some possible applications

MyPreviews might be applied to various businesses and business scenarios:

- As an add-on for existing or future download portals or online retailers. Participating shops would not necessarily need the software-parts described but could simply use a centralized service. Complying with a simple protocol, e.g. for content identification and accounting of the reward/credits, would suffice to be able to use personalized previews.
- As an add-on for the sale of physical media. Audiovisual material, for instance, can be extracted from CD or DVD, and converted into previews. Or, identification mechanisms like CDDB enable consumers to download the respective previews for a given physical media. As for granting rewards, a server trip is needed at some point. But the purchase itself could be done not only online (e.g. online retailers), but also offline.
- As an enhancement for the Potato System, developed by Fraunhofer IDMT and 4fo.<sup>14</sup> The system is based on the idea of letting consumers not only purchase, but also invest into virtual goods, and it therefore uses a distinct type of reward: Every purchaser receives a fraction of subsequent payments. Being reward-agnostic, personalized previews do represent an interesting enhancement, which can be used within the Potato System as “Potato Chips”, for instance within the system’s P2P concept.<sup>15</sup>
- As an alternative format for legal P2P services. Instead of not being able to offer copyrighted content at all, services may use personalized previews. The software needed for that purpose could be integrated into the Peer-To-Peer client.

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<sup>14</sup> 4FriendsOnly.com Internet Technologies AG

<sup>15</sup> See NÜTZEL J., GRIMM R. (2002).

- As a market research instrument. Particularly suited for new releases and new artists/authors, the use of personalized previews can be a useful way to explore the popularity of artists, perceived value and diffusion of content. It may also be used for user matching or to find capable promoters or scouts, who have a keen sense for trends and promising artists.
- For advertisement. References to previews can be distributed electronically, e.g. by Email, or printed, e.g. on concert or movie tickets. Due to the fact that a lower-grade version is used, advertising could be more affordable than it is otherwise.
- Mass distribution of big previews via physical media or networks. In this special case, no user reference would be attached: consumer promotion, otherwise a core element of myPreviews, is left out. The motivation for using big previews could be the two quality levels: Promotional content for instance could be given away, but users would have to do make some effort, e.g. register with a service, in order to get the key for enjoying the full value. Due to security problems (one common key for all copies), the approach however does not seem adequate for the mass-selling of content.

## Summary and Conclusion

Personalized previews represent a straightforward but effective instrument for the marketing of digital goods. By creating incentives for users to give away lower-value versions of the content instead of the purchased original, the positive effects of consumer copying are exploited. While economically somehow representing an equivalent to audio taping, myPreviews offer many advantages, for both the industry and consumers alike:

As for content providers, the proposed approach

- can stimulate sales by winning consumers as highly efficient promoters whose reward is purely success-oriented (no need for up-front payments as with other means of promotion)
- preserves the incentive to purchase the original content, thus avoiding the possible negative effects of consumer copying
- adds consumer value to an existing service, making it more attractive
- can avoid costly protection technology
- can be added to existing online services with comparatively little effort

As for consumers, myPreviews

- offer rewards for promoting content - something that consumers love to do anyway
- offer enhanced possibilities and space for creativity to promote content
- can avoid obtrusive protection technology

Apart from that, they

- may be used for market research purposes (while being able to preserve consumer's privacy)
- support many distribution channels, on- and offline
- support all kinds of business models and rewards
- help to improve the relationship between consumers and the media industry

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