Digital rights management: Desirable, inevitable, and almost irrelevant

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The title of this presentation is a slight modification of that of an earlier lecture on a closely related topic [5]. It reflects a slight exaggeration, but only a slight one, of the general thesis that Digital Rights Management (DRM) technologies will continue to play a modest role in the future of ecommerce.

DRM is attractive for several related reasons. Content providers feel they can get more control over their wares. Such control is comforting in general, and could enable new methods of charging, which might provide greater revenues. More generally, the Internet is enabling sellers to find out much more about buyers' ability and willingness to pay, and also (through DRM and other techniques) is providing sellers with tools to control usage (and thus prevent arbitrage), leading to unprecedented opportunities and incentives for price discrimination [8, 9]. Thus it should not be surprising that extensive efforts have gone into research, development, and deployment of DRM.

Yet the record of DRM so far is not too inspiring. And a rising chorus of voices (including Steve Jobs of Apple) is urging the content industry to give up or at least relax its insistence on DRM. The lecture summarized here will review the arguments of DRM skeptics. This abstract provides a very brief overview of some of the main points. References are given to my papers, where those points are explained in more detail, and citations are provided to the extensive literature on the subject.

The fundamental issue that limits current use and future prospects of DRM is that, in the words of [10],

> The important thing is to *maximize the value* of your intellectual property, not to protect it for the sake of protection.

DRM all too often gets in the way of maximizing the value of intellectual property. To some extent this is the fault of the DRM technologies. We simply do not know how to build secure systems. The last half a century demonstrates this conclusively. And in general we do not know how to build usable systems. In contrast with secure systems, there is more knowledge about usability, and more examples of successful designs, but still only a few, and it is not clear the situation will change.

DRM also gets in the way of maximizing the value of intellectual property by conflicting with some powerful human drives. Much of the potential of DRM for increased revenues and profits comes from the ability for fine-scaled charging and first degree price discrimination. However, people do not like to be bothered with fine-scale decision making. These impose

heavy "mental transaction costs," in Nick Szabo's apt phrase [7]. Partially to avoid them (as well as for several other reasons, discussed in [1]), people are very frequently willing to pay more for flat rate plans than they are for metered ones, even if their usage does not change. The trend towards flat rate plans is not universal, and there is likely to be a spectrum of charging schemes. Flat rate plans are likely to dominate for inexpensive and frequently purchased goods and services, and extreme examples of differential pricing are likely to prevail for expensive and seldom-purchased things, see [4] for a discussion and evidence. But overall, we should expect to see growth in flat rate pricing and bundling (as in subscriptions to magazines, or in a collection of cable channels for a single price).

In addition to a willingness to pay more for flat rate plans, people tend to use more of a good or service that does not involve fine-scale charging or decision making. Typical increases in usage are from 50% to 200% when users are switched from metered to flat rates [4]. Depending on whether one wishes to increase or decrease usage, this may or may not be desirable [2], but in the case of information goods, the overwhelming incentive is to increase usage. This provides yet another incentive to avoid fine-grained pricing and control that DRM is often designed for.

The microeconomic and behavioral economics factors listed above argue against widespread and effective DRM. But so do some macroeconomic ones. Content (meaning material prepared by professionals for wide distribution, such as recorded music, movies, professional sports events, and the like), which is the focus of DRM technologies, is simply not all that large in the economy as a whole. In particular, it is considerably smaller than basic connectivity [4, 6]. And the fraction of the economy devoted to content does not appear to be growing. So even if secure and usable DRM could be built, it most likely would not enlarge the pie, but would at most lead to a redistribution of current money flows. The big growth is likely to come in social uses of broadband [4, 6], in which people engage in a variety of still-to-be-conceived activities that combine their home videos with professional content (something to which today's YouTube is likely just a primitive precursor). Ease of access and transformative use will be key to enabling such applications, and DRM will be an obstruction.

So what is the likely role of DRM? It seems certain that huge further investments in research, development, and deployment will be made, since content industries love the concept and are prepared to pay for it. But actual applications are likely to be far more modest. Still, it is likely that DRM will play a non-trivial role. In the the online world, speed is key, and even small speed bumps are often going to be sufficient to change people's economic decisions [3]. So some small barriers, even ones that are laughably insecure, may very suffice to enable new economic models that let content industries flourish. Let us not forget the long history of content providers opposing new technologies and businesses models, from libraries to the VCR (which was likened by Jack Valenti, the main Hollywood spokesman, to the Boston Strangler) yet learning to live with and love them as time went on [5]. (And indeed, the VCR became one of the main money makers for the movie studios soon after Valenti's infamous claim.)

What we are likely to end up with is a huge universe of free material, much of it of little interest to all but a handful of people. But the usual Pareto and related distributions

will probably apply, so that some of these creations will attract the public's attention, and will also bring in substantial money flows. Some may be from advertising, some from explicit payments that DRM will help stimulate. And there will likely continue to be very expensive items that will be produced by large organizations and will be protected heavily. And in this wide spectrum of information goods, DRM will play a role in extracting money flows to producers, professional and amateur alike, but this DRM is likely to be often very insecure. Usability will continue to matter much more than tight control.

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