

# About this Business of Metadata

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## ABSTRACT

A brief discussion presents some of the opportunities and challenges involved with creating metadata-centric businesses that bring Music Information Retrieval technologies to the marketplace. In particular, two related difficulties -- that of the difficulty of proving incremental value for new metadata systems, and that of the relative influidity of the marketplace for MIR -- are highlighted. Potential directions for resolving these issues are also discussed.

## 1. INTRODUCTION

As research innovation in musical metadata systems proceeds, it is natural to examine the mechanisms by which new results will enter the marketplace. Researchers in the field must (at least sometimes) be interested in improving the experience of day-to-day users of music systems -- online, in stores, or embedded in consumer electronics. And some researchers might hope to become entrepreneurs, turning their academic interest into new business opportunities, and possibly even new companies.

For all these reasons, this brief paper will explore the business implications of music information retrieval systems, and metadata creation and management in particular. Three main sections will outline a sketch of the business opportunity, challenge, and potential solutions involved with bringing MIR systems to the marketplace.

## 2. OPPORTUNITY AND VALUE

The business appeal -- as separate from the academic appeal or scientific motivation -- that must underlie any profit-seeking venture involves *value*. That is, in order for a seller to sell something to a customer, the customer must perceive that he derives more benefit with the product than without it, and must be willing to pay the seller in order to receive the benefit. The amount that the customer is willing to pay in an open market (considering all factors, such as competition, the alternatives to purchasing, etc.) is the definition of the business value of the product.

The question of asking "is there business appeal for metadata and metadata systems?" is therefore the same as asking "is a potential customer willing to pay for the perceived benefit of having (and being able to use) that metadata?"

Ownership of a large collection of metadata itself would not seem a source of benefit for a typical end-user customer (a consumer). The home user listening to a stereo system, or the online user searching a database of online records looking for a new CD to purchase, is not interested in metadata *per se* but only in the metadata as a means to an end -- managing the listening experience or finding what she's looking for more easily. (Philosophically, one might say that to the extent that the metadata information becomes itself the subject of interest, it ceases to be 'meta' and simply becomes data).

Therefore, the end-user is not interested in paying for the metadata itself, but might be interested in paying for the simplified or im-

proved experience that metadata provides. This implies, in turn, that the proper customer market for metadata and metadata systems is not the end consumer, but the intermediaries -- such as record shops and consumer electronics manufacturer -- that provide these experiences. Alternatively, the metadata producer could purchase or develop such an experience as a "carrier" for his metadata system and then sell the experience rather than the metadata to the customer.

What is the perceived benefit that metadata can bring in a user experience? Fortunately -- for those that would be in the metadata business, this benefit is already large and continues to grow. In the modern world, consumers perceive that they are besieged with content offerings -- dozens or hundreds of terrestrial and satellite music channels, thousands of records available at physical stores, tens of thousands of online radio stations on the Net, and millions of tracks available for download through file-sharing services.

The primary benefit of metadata-based experiences must be in their offer to help consumers sort through the clamor of alternatives that compete for attention -- to choose the book, the movie, the piece of music that is most appropriate for *me* at this particular *moment*. In what has come to be called an "Attention Economy" [1], any solution that manages, shapes, or (especially) delivers attention is a source of great potential value.

## 3. CHALLENGES

Given this set of wide-ranging opportunities, is the marketplace attractive for solutions providers? Unfortunately, the answer at the present time is no. There are two major reasons for this. This first is that the benefits of incrementally *superior* metadata delivery are, as yet, unproven. The second is that even with a proven benefit, the market for metadata systems is at present *not fluid*. We will consider each of these in turn.

### 3.1 Perceived Incremental Benefits

Recall from the first section that the source of business value is the perceived incremental benefit of customer access to a good or service. *Incremental* in this case refers to the difference between having access to, for example, a new metadata format, and not having access to it.

An important consideration is that in many cases, the alternative to a prospectively valuable metadata system is not no metadata, but rather is the use of free or commodity metadata. For example, a provider of track-level musical information is required to demonstrate benefits not just beyond having no metadata in the system, but beyond using free track-level information such as that provided formerly by CDDB and now by FreeDB.org.

It may seem obvious to a researcher that a special, proprietary, advanced metadata format (perhaps based on machine listening technology) can outperform low-quality, commodity Track/Title/Artist listings. But the burden of proof still falls on the seller of the purportedly more-valuable system to prove -- quantitatively, whenever possible -- that the *incremental* benefit to the customer is worth the selling price.

### 3.2 Lack of Fluidity

Even if the incremental benefit of a particular technology solution can be quantitatively demonstrated, a second obstacle still maintains. This is a *lack of fluidity* in the marketplace – what an economist might term an inefficiency in the cost of switching.

Consider the electronic program guide (EPG) that helps a user manage television programming on a digital cable or direct-broadcast satellite system (see Fig. 1). The EPG presents the show-level metadata that helps the user decide what show to watch, and thereby (at least in the system provider’s judgment) provides an incremental benefit compared to no EPG that customers are willing to pay for in the form of increased service charges.

Figure 1. An electronic program guide (EPG) helps a TV viewer to decide what program to watch via attractive presentation of program-level metadata.

Now suppose that an enterprising researcher develops a new metadata-based EPG that is clearly superior – in the sense of providing additional incremental benefit – to the built-in EPG. It is still not possible to immediately capitalize on this benefit by selling the EPG directly to a television customer, because today’s television and satellite set-top-boxes are not built to handle interchangeable EPGs. The EPG implementation is, for technical and/or business reasons, tightly coupled to the set-top box itself.

Instead, the sales opportunity for the researcher is only to a cable/satellite operator – either to the present EPG provider, with the argument that the incremental benefit to customers over the current EPG will justify higher monthly charges, or to a competing provider, with the argument that it will encourage customers to switch services.

In either case, there is a cost that now must be balanced against the benefit proposition provided by the incremental technology advantage. This cost is the cost of *switching* to the new EPG system – in the first case, the cost to the current provider required to switch over the infrastructure of a cable system, and in the second, the cost to each consumer of switching providers in order to acquire access to the improved EPG system.

Thus, even in circumstances in which the new technology clearly provides an incremental benefit to customers individually or in aggregate, the increased amount that customers are willing to pay for the new system compared to the old one may still not be enough to justify the switching costs.

### 4. DIRECTIONS TOWARD SOLUTION

Right now, it is not possible to identify solutions to these very difficult channels with full confidence. However, some initial thoughts may provide directions for fruitful work that could help to clear out the logjam in the marketplace.

First, creators of musical metadata and MIR systems that use it have the advantage that there is a great deal of music-related activity on the Internet, predominantly enabled through software appli-

cations. The development and deployment of software implementations of MIR must be considered a more efficient method than incorporating new techniques in, for example, consumer electronics products such as MP3 players.

In particular, in the area of so-called peer-to-peer (P2P) file exchange, there is a rapid and fertile marketplace for new software platforms. Only in the last two years, the leading application has shifted twice, from Napster to Morpheus, and today to BearShare and other Gnutella clients. It is quite likely that a new P2P client program with advanced MIR capability would be an attractive product for one of the small companies that operates in the space. On the other hand, the problematic legal status of these applications (and/or the file-swapping behavior they enable) in various jurisdictions around the world might give pause to researchers with ties to conservative funding bases.

Second, there is some role for standards organizations to play in fostering an active and interoperable marketplace for metadata. MPEG-7 [2] is clearly meant to enable such a marketplace. However, it seems at this early stage that MPEG-7 will be most useful in the case when the application is fixed, and the underlying metadata is improving. From the examples presented at ISMIR [3] and other conferences, it surely is the case that the applications themselves are improving, not only the quality of the metadata. Perhaps MPEG-21, with its broader view of systems, platforms, and owners, will be able to make progress on this front.

Still, it is not always in existing business owners’ interest to support an active, standardized marketplace. Returning to the EPG example, there has been some technical activity in the USA to create a so-called “Open Cable” standard. This would allow third-party manufacturers to build set-top boxes with advanced functionalities, guarantee their interoperation with existing cable services, and sell them directly to consumers. But – as supporting this would effectively enable new competitors to cable operators’ locked-in cable-box rental business where none presently exist – it is perhaps unsurprising that the Open Cable initiative is languishing for lack of support.

Third, not all of the avenues for public dissemination of MIR activity are through strictly competitive businesses. To give two examples, libraries and the European Union are very interested in projects like CUIDADO [4]. It may be that the public benefits – as assessed by public officials – may be sufficient to warrant investment and deployment of some level of metadata infrastructure as a sort of national (or multinational) capital expenditure. However, this avenue also seems unlikely to promise rapid transitions and improvement in metadata systems as research developments warrant, given the typical speed of deployment of governmental systems.

### 5. CONCLUSION

The marketplace for metadata systems is faced with a dilemma that seems unusual (although it is actually rather common in transfer-of-innovation scenarios). This is that, although incremental advances in MIR technology will likely offer incremental benefits to consumers that wish to use digital music systems, it is difficult to find cost justification for *deploying* these systems.

What are the implications for individual researchers and research teams? First, expectations for business interest (including generating funding through licensing activities) must be kept limited for the time being. In fact, organizations that seek to build business partnerships should expect to work on these deployment and value-building issues at least as much as on the core MIR research itself.

Second, the repeated call [5, Ch. 7] for public databases and

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evaluation scenarios must be taken more seriously. As long as MIR systems are evaluated in isolation, not really in a direct comparison with each other, there is no way for a potential customer to understand the incremental benefits of one approach versus another.

Finally, the variety of deployment scenarios (cell phones, Web sites, set-top boxes, consumer electronics, MP3 players, etc) must be rigorously evaluated separately. While some commentators [6] are fond of speaking of the “world of digital music”, in reality, each individual technology area presents its own requirements and challenges. Research that examined the coupling between underlying MIR technology, user interface, and salable goods (for example, cell phone services with reasonable pricing and supply-chain models) would be welcome in this regard.

## **6. REFERENCES**

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