THE LINER NOTES DIGITIZATION PROJECT: PROVIDING USERS WITH CULTURAL, HISTORICAL, AND CRITICAL MUSIC INFORMATION

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ABSTRACT

Digitizing cultural information is a complex endeavor. Not only do users expect to have access to primary information like digital music files; it is also becoming more important for digital systems to provide contextual information for the primary artifacts contained within. The Liner Notes Markup Language (LNML) was developed to provide an XML vocabulary for encoding complex contextual documents that include an album's packaging, informational notes and inserts, liners, and album labels. This paper describes the development of the LNML framework, its major structural elements and functions, and some of the more pressing problems related to usability and purpose. The current LNML model is based on the examination and encoding of fifty albums from the 80s Rock genre. We are currently encoding fifty additional Jazz albums, which will provide data to augment and strengthen the model. Development of the LNML is ongoing, with plans to examine Classical and World Music examples to further augment the model.

1. DIGITIZING CONTEXTUAL INFORMATION

Digitizing cultural information is a complex endeavor. Not only do users expect to have access to primary information like the content of a literary work, or digital music files; it is also becoming more important for digital systems to provide contextual information for the primary artifacts contained within. When providing access to physical objects, communicating context is relatively straightforward: physical aesthetic cues give the user subtle but important contextual information about the object, while supporting information is available at a glance. This is not true for digital artifacts, which must have their implicit contextual information explicitly defined.

In addition to bibliographic information, album packaging includes information pertaining to the historical context and critical reception of music contained within. Liner notes often contain essays written by major critics or cultural figures; the notes record authoritative information on the group, its members, and recording details; and the aesthetic design of the packaging helps scholars place the work historically in context. Unfortunately, in terms of vinyl collections, album packaging was often discarded when the artifact was added to an institutional collection, and if the notes were kept, the information contained in the packaging was unlikely to be digitized. The result is that unless users have access to an original pristine physical artifact, much of this important cultural and historical information is lost.

Musical album packaging (defined here as the entirety of the physical manifestation of a musical work: the album label, the outside jacket and the album sleeve) contains a significant amount of contextual information, which is rarely included with digital manifestations of that content. The supporting materials, like the physical packaging, liner notes, album label, album design, and album art are a valuable resource for people who want to delve deeper into the music they listen to. For example, Jazz albums typically use the physical album label to define the company that produced the record, the pressing and publisher's catalog numbers, the genre, sub-genre, and instrumentation information, the title of the song, the composter, arranger, performing unit, and a full list of musicians, as illustrated in Figure 1. In contrast, popular music applications like iTunes typically include inadequate and incorrect or misleading information with their sound files. For example, the "Information" tab in iTunes provides access to Song Title, Artist, Album, and Year, and the "Year" element typically refers to the date the album was digitally re-mastered or released, not the original creation or release date (which is not represented anywhere).
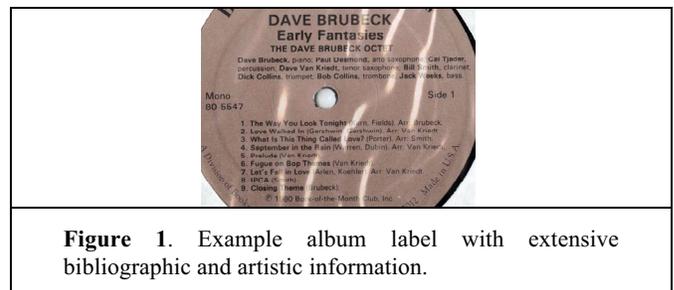

Figure 1. Example album label with extensive bibliographic and artistic information.

The inadequate representation models used by commercial music vendors are problematic not only because they introduce a level of confusion into the information seeking process, but also because they subvert the method by which music enthusiasts learn. Instead of relying on experts, Jazz aficionados can, and do, examine their album packaging to get a good idea of the musician / artistic networks involved in the production of a work. One of the ways in which Jazz, in particular, has remained an accessible and ever more popular art form is because fans can educate themselves through their music collections. Without a rich representational scheme to model the implicit contextual information contained in an album's packaging, music runs the risk of losing its immediacy and appeal. Instead of remaining a popular and approachable artistic form, only those people with access to physical artifacts will be able to claim expert status.

2. CURRENT WORK

There are a number of academically based digitization projects that provide, or are concerned with providing, rich access to bibliographical information associated with an album or individual song. For example, the VARIATIONS 2 project at Indiana University provides extensive information about artists, conductors, arrangers, and instrumentalists for each recording [3]. The Handel Project at McGill [4] has developed a rigorous digitization process and proposed a metadata model for phonograph digitization, which includes album packaging and liner notes, but does not provide a method for providing encoded access to the notes themselves.

Industry players have also recognized the user need for access to the implicit contextual information contained in liner notes, and often include this type of information on websites for historically significant albums. In classical music, Naxos [5], for example often provides PDF images of the front and back cover of the albums in their catalog, and many of the albums also have contextualizing critical essays written for the website by music experts. Some of the albums in the Verve Vault contain complete instrumentalist listings [7] with cross listings to related albums. While many music lovers appreciate the rich interactive information resource provided by Naxos and Verve, many are impatient for the complete information from the liner notes themselves to become available [1].

To facilitate the preservation, study, and analysis of contextual musical information, the project team digitized original album packaging, including labels and liners, and developed an XML vocabulary suitable for encoding the varied and complex data and metadata found on these artifacts [9].

3. GOALS OF THE LINER NOTES MARKUP LANGUAGE

An album's packaging was often designed to convey a specific mood or aesthetic impression, which fed into a deeper understanding of the album's music. Design elements like layout, font choice, illustrations, photographs, and the varied juxtaposition of these elements imply creative and cultural decisions on the part of the group, producers, production label, and the design team. In the development of the LNML, the emphasis was to encode the information found in album packaging in such a way that would enable future access by laypeople, and research on musicological as well as artistic and design-oriented work.

4. DEVELOPMENT STRATEGY

4.1. Background Work

Work done by the xipf working group [10] and the creators of the Comic Book Markup Language [8] provided a starting point for development of the LNML, which is based on the XML vocabulary developed by the Text Encoding Initiative (TEI) [6]. The TEI was originally designed to encode texts like novels, poems, drama, and dictionaries, and is the standard upon which most text encoding is done today. The TEI model provides an extensive vocabulary as well as a well-documented and standardized method for extending and modifying models to encode scholarly texts. It also provides a useful framework for encoding an album's basic textual features. However, the TEI does not readily describe some of the more design-oriented elements of album packaging, like complex arrangement, the importance of physical layout of information in sequence, and the advertisements. While an argument could be made for developing an entirely new vocabulary to describe album packaging, that route would hinder interoperability and widespread utility of the LNML.

The first iteration of the LNML was developed using a single representative instance of a pop album: Culture Club's *Kissing to be Clever*. This album was chosen because it contained a broad range of physical and conceptual elements present in rock album packaging at that time: the packaging opens up to reveal a "book," the album's liner was not blank and contained extra information about the band and the album's creation process, and the album label contained musicological information not found anywhere else on the packaging. Using this album as a model ensured that many of the metadata, structural, and vocabulary issues involved in the encoding of album packaging would be encountered and addressed in the first iteration of the document model.

After developing the initial framework, fifty students were given fifty unique albums to encode using the LNML. The students were members of the iSchool

community at the University of Texas at Austin, enrolled in either "Organizing and Providing Access to Information," or "Survey of Digitization," in the Spring of 2007. The students were given "80s Rock" albums with genres spanning from straight commercial pop artists like Adam Ant and Duran Duran to post-punk groups such as The Talking Heads and The Clash. Students were asked to encode their album's packaging using the LNML, and to record any cases where the model did not fit their particular album instance. Student comments were used to enhance and strengthen the descriptive properties of the LNML model. In an attempt to ensure the general applicability of the document model, the LNML is currently being tested against Jazz album packaging.

4.2. The Structure of Album Packaging

The physical format of album packaging is relatively static, and its purpose, and hence its intellectual content, tends to remain the same through genres and styles. While the design elements of an album's packaging express a certain aesthetic principle, the content on that packaging generally remains focused on conveying information about the musical group, the music, and the production process.

Because placement of information on packaging is strategic (i.e., information on the outside jacket can be viewed through plastic wrap), the structure of the packaging forms the heart of the LNML framework. There are five major structural elements within an album framework: Outside Jacket, Album Sleeve, Album Label, Book, and Book Insert.

The names of the elements are fairly self-explanatory: the *Outside Jacket* contains that information which can be viewed if the album is encased in plastic wrap: the front and back covers, and the spine. The *Album Sleeve*, also called the "Liner," protects the vinyl album from the cardboard packaging. The majority of "80s Rock" albums encoded in the first batch had sleeves that contained a great deal of extra information. This is not the case for the Jazz albums examined so far. The *Album Label* is the paper label placed at the center of the vinyl album. These first three elements are mandatory within the LNML framework, even if their value is "null."

The last two elements are optional. The *Book* element would be encoded if the packaging opens up to reveal a scrapbook-like entity. This can simply be a verso of the front cover and the verso of the back cover, or can include more pages bound into the packaging.

The *Book Insert* is more unusual, and describes a separate booklet included with the packaging, often describing (in the initial set of albums) more biographical information, dance steps to try with the music, or a catalog of other albums produced by the same music label.

All of the structural elements allow for a combination of sub-elements: AlbumTitle, ChannelType, ArtistName,

BandList, CatNum, ContactInfo, ContribList, CreditStmt, SongList, and Thanks are the most common, and each has its own set of sub-elements and associated attributes.

4.3. Metadata

One of the major motivations in the development of the LNML was simply to provide access to the information on album packaging, which was either inaccessible or lost. However, there is also the expectation that development of the LNML will add value and functionality through the use of defining attributes not available in the original physical packaging. The LNML provides three methods for defining album metadata: through the LNML Header, element attributes, and through the use of IDREFs outside the document.

4.3.1. The LMNL Header

As with the TEI, the LNML requires bibliographic information about the artifact and the digitizing authority to be recorded in the Header. The LNML Header has four sections: 1) the File Description, which describes the artifact being encoded; 2) the Encoding Description, which describes the digitizing entity and the editorial and taxonomic decisions made as pertains to digitization of the artifact; 3) the Profile Description, which includes formal cataloging information and keywords; and 4) Revision Descriptions, which record any changes made to the file.

The LNML Header can be a large and complicated object, or it can be very simple. While much of the information included in the LNML Header is similar to common library bibliographic standards (like MARC), the Header does allow for the rich description of a number of elements not available in traditional library models. Specifically, disambiguating the description of the source from the creation of its digital counterpart is valuable, as is the ability to record a history of revision to the digital document. The Header provides a space that can augment and extend the MARC model, particularly for non-print sources.

4.3.2. Element Attributes and the use of IDREF

Digitizing and encoding a physical artifact using the LNML allows for the explicit definition of personal names, pseudonyms, and place names, as well as the addition of geographical information, and the disambiguation of relationships among musicians, engineers, arrangers, and studios. To give a simple example, one of Charlie Parker's pseudonyms, in addition to "Bird," was "Charlie Chan" [2]. This might be common knowledge among Jazz experts, but this particular pseudonym is not common knowledge among laypeople, and we cannot assume this information will be carried into

the future. LNML enables the clarification of names, places and terms in two ways: 1) through the use of object attributes, and 2) through the use of IDREF attributes, which point to a single authoritative and regularized name, biographical information, and a list of the multiple name and identity variations. Figure 2 illustrates the use of element attributes.

```
<contributor>
    <name type="person" reg="Parker, Charlie"><ref id="Parker">Charlie Chan</ref></name>
    <role>Sax</role>
</contributor>
```

Figure 2. Name attributes for the Name Entity Charlie Parker.

Here the added metadata, not present in the original, allows a user to find songs written, arranged, or performed not only by Charlie Parker but also by his pseudonymous identity "Charlie Chan." By then linking this information to an IDREF, denoted by the "ref" tag here, users will additionally be able to find all other pseudonyms associated with this person that have been included in the collection.

5. OUTSTANDING ISSUES WITH THE LMNL MODEL

The LNML provides a sound framework for encoding explicit information on album packaging. However, implicit information is still proving difficult to encode. There are three major issues that must be addressed in future iterations of the LNML model to ensure general usefulness: 1) the presence of unstated information; 2) the use of aesthetic objects to convey meaning; and 3) the seemingly limitless possibility of disambiguation.
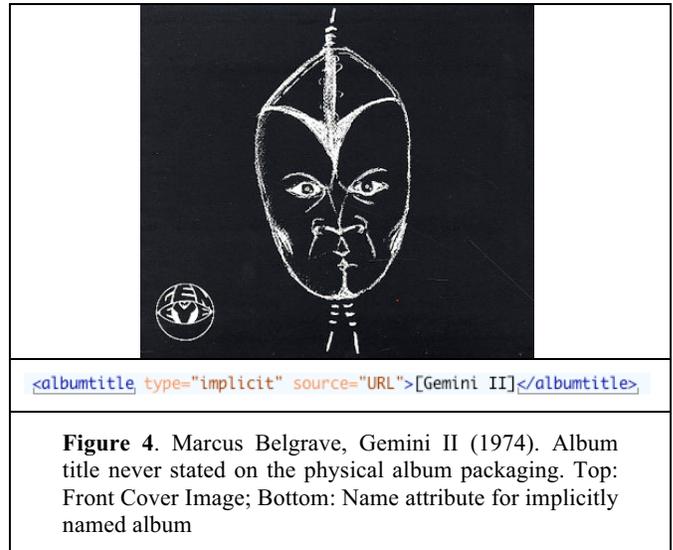
5.1. Unstated Information
A number of the "80s Rock" albums encoded in the first batch were "eponymous" albums, and did not explicitly include the album name anywhere on the physical album itself. Because eponymously named albums are somewhat common, it was relatively easy to add the "type=eponymous," and "source=*URL*" attributes to the AlbumTitle Element, and disambiguate meaning (Figure 3) by placing the album title itself within brackets.

```
<albumtitle type="eponymous" source="URL">[The Beatles]</albumtitle>
```

Figure 3. Eponymous Album Title.

The Jazz albums presented a different set of problems concerning unstated information. One specific example was Marcus Belgrave's Gemini II (Figure 4), which does not state the title anywhere on the album. To handle this type of problem, the LNML framework provides an AlbumTitle attribute, "type=implicit," which will allow encoders to provide the title, while encoding the physical reality of the album packaging.


```
<albumtitle type="implicit" source="URL">[Gemini II]</albumtitle>
```

Figure 4. Marcus Belgrave, Gemini II (1974). Album title never stated on the physical album packaging. Top: Front Cover Image; Bottom: Name attribute for implicitly named album

5.2. Aesthetic Design Conveys Meaning

In design-based information contexts like album packaging, text is often conceptually linked to an image, and often the design components carry meaning. Because of this relationship between text and image, it was impossible to sufficiently represent these objects using XML alone; future work involves development of an interface that integrates images with encoded textual data and metadata. In addition to this anticipated issue related to the limited ability of XML to encode design-oriented elements, a number of the Jazz albums from the test collection used aesthetic objects to convey primarily textual information like song titles (Figure 5).
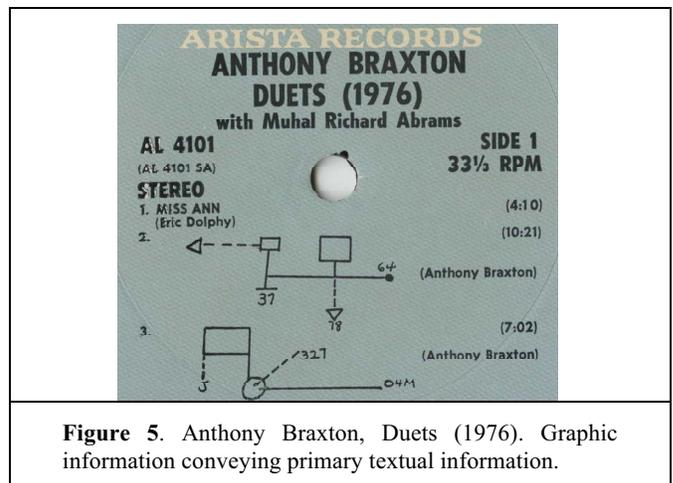
Figure 5. Anthony Braxton, Duets (1976). Graphic information conveying primary textual information.

By doing research, we were able to ascertain that the second composition on the first side of Anthony Braxton's *Duets* (illustrated in figure 5) is commonly called "Comp. 60," and the third is called "Comp. 40 P." In an attempt to encode as much information as possible, the next iteration of the LNML will augment the SongTitle, AlbumTitle and ArtistName elements by allowing for image links, and will also provide additional element attributes, such as "type=graphic," "source=*URL*," and "description= *FreeText*."

5.3. Where Does it All Stop?

The above examples illustrate the richness and complexity of information found on album packaging. Even seemingly straightforward elements like "AlbumTitle" and "SongTitle" prove to be complex once real physical artifacts are encountered. Furthermore, the somewhat straightforward task of linking authoritative names with pseudonyms and nicknames will be time consuming and ongoing.

While the primary purpose of this project is to provide important contextual and implicit information to music users, the reality of providing this information for a large number of works is unrealistic. The traditional model of expert encoders working on single instances of digital artifacts simply will not scale.

6. FUTURE WORK & CONCLUSION

The current LNML model is based on examination of fifty albums from the 80s Rock genre, and is being augmented by the inspection of an additional fifty Jazz albums. Future work includes working with World Music and Classical Music examples. Development of the LNML is ongoing, but we believe that once the major issues raised by the inclusion of Jazz albums are resolved, the LNML framework will provide a valid means of encoding contextual information contained in album packaging for various genres and time periods.

As mentioned in part 5 of this paper, encoding album packing is both labor- and knowledge- intensive. Because of this, the project team has decided that the next phase of this research project will include a focus on the capabilities of social networking to generate data. Development will soon begin on an online application that will allow users to upload, augment, and share their iTunes XML libraries using the LNML framework. We believe that the promise of more powerful searching, the capability to create more interesting playlists, and the development of online communities around music collections will appeal to users, and will lead to extensive self-markup of their collections. We intend to initially target the Jazz community, because they tend to be the community most actively calling for the digitization of packaging information.

The LNML was developed to provide an XML vocabulary for encoding complex contextual documents that include an album's packaging, informational notes and inserts, liners, and album labels. Access to this information will facilitate new forms of musical scholarship, community, and self-education. This paper described the initial development of the LNML XML framework, its major structural elements and functions, and some of the more pressing problems related to usability and purpose. Future work will focus on innovative data generation techniques, using social classification and user-based markup.

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