

**Project #2: DAM System, Metadata, Taxonomy, and Workflow for Record Label**

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In the words of John Horodyski, “DAM consists of the management tasks and technological functionality designed to enhance the inventory, control, and distribution of digital assets (rich media such as photographs, videos, graphics, logos, marketing collateral) surrounding the ingestion, annotation, cataloguing, storage, retrieval, and distribution of digital assets for use and reuse in marketing or business operations” (Horodyski, 2016, 12). Another definition that I resisted at first but now makes a surprising amount of sense is to call a DAM a “single source of truth” for creative assets.

### **What is the goal of DAM system?**

For this project, I will outline a DAM system for a mid-sized record label. Our label is a publisher of music. We fund the production of music by musicians in studios, etc. We coordinate the distribution of music. We produce marketing packages such as band photos, cover art, liner notes, and artist websites. We also control the rights of the music produced by our contracted artists and license their music and images for use in movies and distribution on platforms such as Spotify and Apple Music.

Our digital assets include:

- Images (Album art, photos of the artist(s))
- Audio Files (songs)
- Albums (collections of songs)
- Music Videos
  - Other artist videos (interviews, tour video diaries, etc)

### What is your metadata model(s)?

I will start with some random thoughts on music metadata.

In short, “A metadata model represents a collection of metadata information that describes a complete structure of data” (jboss.org, 2020). As Bill Rosenblatt notes in a 2019 article about the importance of music metadata standardization, “metadata helps artists and labels describe their offerings; it helps digital music services organize their catalogs; and most importantly of all, it helps users find music” (Rosenblatt, 2019).

I liken music metadata to liner notes—the informative text about the music written on the back of LP records or on the folded-up glossy insert in music CD cases. But that’s only one part of it. Dmitry Pastukhov, writing for Soundcharts blog, delineates three types of music metadata: Descriptive, Ownership/Performing rights, and Recommendation (2019):

- *Descriptive metadata* is basically the liner notes I described above
- *Ownership/Performing rights metadata* have to do with legal and licensing issues which I’ll cover in a later section.
- *Recommendation metadata* is everything that might be used to categorize music for a recommendation engine, such as genre, subgenre, style, and BPM.

As home music players (iPod, Alexa & Echo speakers, Google Home speaker), music search engines (Google, Spotify, etc), and music recommendation engines (Pandora, Spotify, etc) become more varied and diverse, the need for a standard music metadata becomes more and more critical. How else will a record label be able to release new music to all of these platforms

and players simultaneously and flawlessly? Furthermore, when a song does get released, usually just the audio file is released. How will anyone know the critical minutia about the song, like: Who played drums? Who produced it? Who arranged the strings?

***Should we use a standard metadata schema OR create our own from scratch?***

To avoid the pitfalls and punishments of plagiarism, most students learn early on that copying is BAD and creating your own work from scratch is GOOD. This is not, however, the case when it comes to metadata. Because metadata is the label that an object carries from one network to another, from one computer to the next—in order for our personal computers and devices to know that the object it’s downloading is a “song recording,” how will the computer know what to find for you when you ask it to find all of the “song recordings” on your computer? How will the search engine know that those big files you have on your website are actually songs within an album? These are simple examples of why consistency and standardization in metadata is important.

To enable the fruits of consistency, I’m constructing my record label’s metadata model from metadata types and properties from Schema.org’s metadata standards. This is *not*, however, the only music metadata standard that exists. Music metadata schemas are numerous and come from AllMusic, Musicbrainz, DDEX MEAD, and even w3.org and purl.org. These schemas provide specifications for “embedding music-related data on a web page and exposing music-related data as part of an API” (Musicontology.com, n.d.). For further exploration of this topic, I recommend Musicontology.com’s Getting Started page:

<http://musicontology.com/docs/getting-started.html>. I provide a brief discussion of DDEX’s MEAD below.

In any case, Schema.org, while lacking very specific and granular musical attributes, provides sufficient types and properties to enable the storage and retrieval of music within my record label organization. As a next step, for any customer facing tracks, albums, events, or other products related to a music artist, I would recommend fleshing out embedded music-related data with as many music metadata standard schemas as is possible to squeeze into the source code.

### ***Schema.org***

Schema.org is a collaboration between the major search engines (Yahoo, Bing, Google, and Yandex) to create consistent metadata to be used as markup on web pages. When the web pages are crawled, the search engines are able to pick up more information about what everything on the page is. In addition to general consistency, this enables a multitude of direct displays that help display web page data in new and more interesting ways beyond the traditional 10 blue links. As Google says, “Once Google understands your page data more clearly, it can be presented more attractively and in new ways in Google Search” (Support.google.com, 2021).

Here is an example of how music artists and albums with proper metadata can be displayed in more attractive and meaningful ways:

Google

metallica albums

All Images Videos Shopping News More Settings Tools

**Metallica > Albums**

 Master of Puppets 1986	 Metallica 1991	 ...And Justice for All 1988	 Ride the Lightning 1984	 S&M2 2020
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Google

metallica songs

All Videos News Images Shopping More Settings Tools

**Metallica > Songs**

 Nothing Else Matters Metallica · 1991	 One ...And Justice for All · 1988	 Seek & Destroy No Life 'Til Leather · 1982
 Enter Sandman Metallica · 1991	 Whiskey in the Jar Garage Inc. · 1998	 Wherever I May Roam Metallica · 1991
 The Unforgiven Metallica · 1991	 Fade To Black Ride the Lightning · 1984	

It should also be noted that in order to make any web facing files understandable by Google, in addition to following standards available at Schema.org, one should also utilize Google’s “Structured Data Markup Helper,” which “helps you mark up elements on your web page so that Google can understand the data on the page” (Support.Google.com, 2021).

## ***MEAD***

In October of 2019, the music industry standards body, DDEX, introduced a new set of standard music metadata which is supposed to be the one standard to rule them all. DDEX stands for Digital Data Exchange, LLC—a non-profit consortium of leading media companies—such as Spotify, Apple Music, Pandora, Google, and the like—founded in 2006 for the purpose of devising metadata standards for the purpose of communicating information about works, tracks, and products (including ownership and sales information) (About ddex.net, n.d.). Their latest standard is called MEAD (for Media Enrichment and Description). “The MEAD standard enables record labels to provide structured metadata that makes it easier for voice assistants to glean the relevant characteristics of each music track, which can lead them to select music tracks more precisely in response to users’ queries” (Rosenblatt, 2019).

## ***Internal Workflow Attributes/Fields***

But wait, there’s more... In the context of a record label, there should also be workflow-related metadata fields to indicate whether or not an audio file, music video file, or artist photo is a demo, a draft, or a final copy. There is also a “contactPoint” field attached to each file to indicate who in our organization should be contacted with any questions.

## ***Music Artist/Group – Schema.org***

The following is a partial list of selected metadata properties from Schema.org’s “MusicGroup” type, which is defined as “A musical group, such as a band, an orchestra, or a choir. Can also be a solo musician” (Schema.org MusicGroup, 2021). Other properties come

from the more general “Organization” type and are included by Schema.org as part of the MusicGroup type.

It is important to make all of these attributes searchable like keywords so that employees can easily answer questions such as, “What band is James Hetfield in?”

Property	Example	Definition
@type	MusicGroup, Organization	Music be included in header: <a href="https://schema.org/MusicGroup">https://schema.org/MusicGroup</a>
name	“Metallica”	Band or artist name
genre	“Heavy Metal”, “Thrash Metal”	Genre or subgenre of creative work or group
album		Latest album release or featured album. Links to “MusicAlbum” type. Links to “Offer” type.
track		Latest release or featured song (example: voice search requests for band). Links to “MusicRecording” type. Links to “Offer” type.
event		Upcoming concert or event. Links to “Event” type. Links to “Offer” type.
founder	“James Hetfield”, “Lars Ulrich”	A person who founded the organization. <i>Inverse Property: founderOf</i>
member	“James Hetfield”, “Lars Ulrich”, “Kirk Hammit”, “Robert Trujillo”	A member of a MusicGroup or Organization. <i>Inverse property: memberOf</i>
alumni	“Dave Mustaine”, “Ron McGovney”, “Cliff Burton”, “Jason Newsted”	Former members.
contactPoint		Member of our organization to be contacted regarding this music artist.
address		Fan club or business correspondence
email		Email address
url	<a href="https://www.metallica.com/">https://www.metallica.com/</a>	Official URL of band or artist

### *Photos*

Selected properties from Schema.org's type Photograph (Thing > CreativeWork > Photograph).

Would also be used to describe graphic art and other images. All photographs be linked to a specific band, album, or song.

<b>Property</b>	<b>Definition</b>
creator	Photographer or artist who made the image
editor	Anyone else involved in the production of the photograph.
dateCreated	The date on which the work was created or added to a data feed
about	The subject matter of the photograph or image
isPartOf	Space to include related band, album, or song name. Links to existing artists, tracks, and albums.
identifier	An identifying code specific to our organization
publisher	Our label
license	A license document that applies to this content, typically indicated by URL.
keywords	Keywords or tags used to describe this item. Comma separated list.
url	URL location of the item

### *Track*

Selected properties from Schema.org type MusicRecording (Thing > CreativeWork > MusicRecording) and some properties specific to music production which I'm adding in rough form. Specific property names should be taken from DDEX's MEAD music metadata standard once MEAD license is acquired.

Track metadata is very important as it allows everyone responsible for the creation of a song to get paid, including songwriters, producers, songwriters, and performers. More about this in the “Legal/Licensing Issues” section below.

<b>Property</b>	<b>Definition</b>
name	Name of the song
byArtist	The artist that performed this album. Links to MusicGroup type.
duration	The duration of the item in ISO 8601 date format.
inAlbum	The album to which this recording belongs
isrcCode	The International Standard Recording Code for the recording
acquireLicensePage	Indicates a page documenting how licenses for this song can be purchased or acquired.
genre	Genre of the song. Should be taken from various genre standards. Can be multiple, overlapping genres.
dateCreated	The date on which the song was created or the item was added to a DataFeed
datePublished	Release date or date of first broadcast or publication.
publisher	Our record label
producer	Producer of song. Include only one. For multiple producers, use multiple fields. Used in royalty distribution.
songwriter	Writer of song. Include only one. For multiple songwriters, use multiple fields. Used in royalty distribution.
additionalMusician	Any musician performing on the song that is not a listed member of the band. Include only one. For multiple additional musicians, use multiple fields. Include instrument played. Used in royalty distribution.
audioEngineer	Audio engineer. Include only one. For multiple engineers, use multiple fields. Used in royalty distribution.

### **What is your taxonomy?**

According to Emily Kolvitz of Bynder.com, the first step in creating a taxonomy for digital asset management is to “appraise your assets” (2017). After careful analysis of my imaginary record label, it is clear that our digital assets are as follows:

- **Artist or Band:** Folder containing artist or band photos and tracks
  - **Albums:** Folder containing tracks and photos related to the album.
    - **Tracks:** Folder containing one song in various formats with photos related to that specific track (if any).
      - File types
        - .MP3, .MP4, .M4A, .WMA: Small, compressed, low-quality files for easy transfer and download
        - .WAV, .AIFF (Lossless), .FLAC: High-definition, high-quality master tracks for archive, CD creation, and high-definition downloads.
      - Photos: Photos related to that specific track

During production, only high-definition tracks are used. After final mixdown, file formats are varied depending on what each customer wants to download. From our website, the customer may select any of the above listed types. Apple Music and Apple iTunes specifically requests mixes be in M4A format because they are smaller in size and still relatively high in quality (Schmidt, 2020). Spotify and other cloud-based retailers and streaming services may choose the same, but they have the option of choosing whichever works best for them.

- **Photos**

- File types
  - TIFF: High-quality files. Used in production (Photoshop, InDesign) and for printing.

- JPEG: Lower-quality: Used on websites.

Photos are used for album covers, single covers, and to create promotional material such as posters and web pages. Photos are also circulated to music journalists to use when they publish a review or article about our artists. Photos are stored in Artist folders when they pertain generally to the artist, in Album folders when they specifically pertain to the Album, and in Track folders when they specifically pertain to a track (as in a single).

Because we are a mid-sized record label with 50-70 artists on our roster, our search will be in a drop-down menu which lists all 50-70 bands. Employees will also be able to keyword search for song titles, album titles, band members, and any terms included in the metadata. We're right at the point where we might start splitting the bands up into specific genres, but not yet. Even though our company directory does not need to be broken up according to genre, we will absolutely include standard genre information in the metadata for customer-facing tracks and albums.

Photos will be more numerous and will be available via a directory listing as shown above:

- Artist or Band
  - Albums
    - Tracks
      - Track Photos
      - Audio Files
    - Album Photos

- o General artist or band photos (not related to any particular track or album)

By keeping the photos with the related track and album, we will be able to prevent employees from sending a photo related to the previous release out with the current release. Photos will always be listed in chronological order (newest first), and thumbnails will appear in the directory next to the album, track, or artist.

### **Consideration of workflow issues?**

Considering that there is currently a crisis in music of songwriters, performers, producers, and engineers (more on this later) not being credited for work they are doing, an important part of our workflow must be to include full credits at every step of production. We must institute a way to include everyone involved in the making of a track—from sound engineers to members of a string quartet added in post-production—in that track’s metadata.

Metadata useful to mastering must also be included in the WAV files during production with attributes such as: project name, recording date, bit depth, sample rate, BPM. Metadata indicating the studio would also be helpful for billing later. Within the DAM system itself, it would be convenient if files could be automatically converted to and from various audio formats.

### **Consideration for digital preservation of assets**

Our strategy for the digital preservation of assets will be pretty straightforward:

1. Store files on an internal server in non-proprietary formats such as WAV, MP3, and M4A
2. Back-up our internal servers using cloud backup services
3. Include as much well-formed and properly labeled metadata as possible with all files
4. Keep physical recordings (reel-to-reel tapes, CDs, DATs, etc) neatly stored in a climate-controlled storage facility.

### **Consideration of any licensing / legal issues.**

#### ***DDEX MEAD Licensing***

Though DDEX MEAD is arguably the new industry standard, it should be noted that use of DDEX MEAD metadata requires a license. This snippet is taken from DDEX MEAD's XML Schema Definition file:

<http://service.ddex.net/xml/mead/10/media-enrichment-and-description.xsd>

This XML Schema Definition file is, together with all DDEX standards, subject to two licences: If you wish to evaluate whether the standard meets your needs please have a look at the Evaluation Licence at <https://kb.ddex.net/display/GBK/Evaluation+Licence+for+DDEX+Standards>. If you want to implement and use this DDEX standard, please take out an Implementation Licence. For details please go to <http://ddex.net/apply-ddex-implementation-licence>.

#### ***Crisis in Song Metadata***

According to an article on The Verge called “Metadata is the Biggest Little Problem Plaguing the Music Industry,” there is currently a crisis in song metadata related to artists not being credited on songs and therefore not receiving money from services like Spotify or Apple Music. “It’s a crisis that has left, by some estimations, billions on the table unpaid to musicians” (Deahl, 2019).

“Metadata sounds like one of the smallest, most boring things in music. But as it turns out, it’s one of the most important, complex, and broken, leaving many musicians unable to get paid for their work” (Deahl, 2019). The article goes on to say that there is currently no standard for how music metadata is collected or displayed, nor is there a need or an effort to verify the accuracy of a song’s metadata before it gets released. For this reason, it is critical that we attach as much metadata as possible about producers, engineers, performers, and writers to each track that we submit to Apple Music and Spotify.

But more than that, the metadata has to be applied using universally accepted and understood standard metadata schemas. “Part of the problem is the fields everyone has chosen to write into their software to populate these credits are all different,’ says entertainment lawyer Jeff Becker of Swanson, Martin & Bell. ‘So if a credit is sent to a database that says “Pro Tools engineer,” but that database doesn’t have that field, they either choose to change it or ignore it altogether. Typically they ignore it, and that credit has nowhere to go” (Deahl, 2019).

Here are a few solutions according to problems that the Deahl article outlines:

1. In song metadata, enter artist name “first name last name,” NOT “last name, first name” because listing a name like that will result in a rejection from Apple Music and Spotify.
2. Never enter multiple names in the same artist field. Each artist gets their own field.
3. Use TuneCore to upload music to upload music to Apple Music and Spotify.

It is a great tragedy in music that there is not a centralized database and set standards for music metadata, and as a result people aren't getting paid. We must do our best to follow guidelines from Apple Music and Spotify and include as much well-formed and properly labeled metadata with our songs as possible. Most importantly, if we find that royalties are not being allocated properly, we must make every effort to ensure that all of our artists, producers, engineers, and writers get paid.

### **Consideration of possible DAM system to use**

Of three common deployment models—on-premise DAM, cloud-based DAM, or hybrid DAM—I feel that a hybrid DAM will meet our needs best. A hybrid DAM is a system hosted both in the cloud and on-premise simultaneously. Because most music is sold via the cloud nowadays, much of our catalog will also be in the cloud, but for archiving purposes, we will also keep a server with high-definition master copies of the songs and all of the individual tracks on our own servers.

Search is always critical and we should be able to search through all metadata attributes to answer questions such as, “Which songs did so-and-so produce during a particular time period at a particular studio?” DAM features should include:

- Ability to add custom metadata filters
- Support for multiple music metadata standards such as DDEX's MEAD and Schema.org
- Keyword-search functions that searches through all metadata
- Automatic duplicate finder

- Boolean search using word/phrase combinations
- Recently added file search
- Vertical category search
- Automatic file conversion
- Maybe...auto-tagging with AI to identify aspects of the music such as mood. Is such a thing even possible?
- Support for various audio formats
- Support for various photo formats
- Support for light audio editing (cropping, fade-in, etc)
- Remote collaboration

After scouring the internet for DAM systems specific to record labels, I've settled on AudioSalad. They would fulfill the above wishlist as well as giving our label the ability to:

- Manage metadata
- Distribute releases to top DSPs
- Send pitches to business partners
- Sell digital and physical products directly to fans
- Allow production teams to collaborate on projects from anywhere in the world

(AudioSalad for Labels, 2021)

## References

*About DDEX - DDEX.* (2021). <https://ddex.net/about-ddex/>.

*AudioSalad for Labels.* AudioSalad. (2019, September 27).

<http://www.audiosalad.com/solutions/audiosalad-for-labels/>.

Deahl, D. (2019, May 29). *Metadata is the biggest little problem plaguing the music industry.*

The Verge.

<https://www.theverge.com/2019/5/29/18531476/music-industry-song-royalties-metadata-copyright-edit-problems>.

Google. (2021). *Structured Data Markup Helper - Search Console Help.* Google.

<https://support.google.com/webmasters/answer/3069489?hl=en>.

Horodyski, J. (2016). *Inform, transform, and outperform: digital content strategies to optimize your business for growth.* Advantage.

*JBoss.org Community Documentation: Chapter 1. Introduction.* Chapter 1. Introduction. (2021).

<https://docs.jboss.org/teiid/designer/6.0/user-guide/intro-chapter.html>.

Pastukhov, D. (2019, July 15). *Market Intelligence for the Music Industry.* Soundcharts.

<https://soundcharts.com/blog/music-metadata>.

Pickering, R. *Getting started.* The Music Ontology – Getting started.

<http://musicontology.com/docs/getting-started.html>.

Rosenblatt, B. (2019, October 17). *New Metadata Standard Will Make Music Easier To Find*.

Forbes.

<https://www.forbes.com/sites/billrosenblatt/2019/10/15/a-new-standard-that-makes-music-easier-to-find/>.

Schmidt, C. (2021, February 15). *Audio file types – 7 popular options to consider*. Canto.

<https://www.canto.com/blog/audio-file-types/>.