WHITE PAPER
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Video Metadata: Management & Tools

IBM **Watson Media**

The concept of metadata for video content isn't new, but getting everyone on board to recognize its importance is a challenge.

Metadata augmentation is a method for adding additional descriptive data to an asset, ranging from categories and taxonomies, textual descriptions or other characteristics, including on-screen semantic cues. This additional data is then stored and paired with its relevant catalog of video and made accessible to whatever mechanism, be it human or APIs (application program interfaces), is needed to retrieve and act on that metadata. Due to the expansion of content libraries, the importance of detailed, updated, accurate metadata is critical. This importance can drive real results as well, from empowering discoverability, driving deeper business intelligence, providing more accurate financial reporting, or creating new user experiences.

This paper details the importance and long term value of video metadata and describes the rich tools available with the IBM Watson Media's Logistics Manager solution and the added flexibility it brings based on metadata, from transcoding processes to content pricing.

The Importance of Metadata for Video

When it comes to video, metadata is often used to describe information related to the video asset. This can be visible text to the end user, from tags and descriptions, but also invisible to them, such as keywords or digital rights management (DRM) information used to secure an asset against piracy concerns.

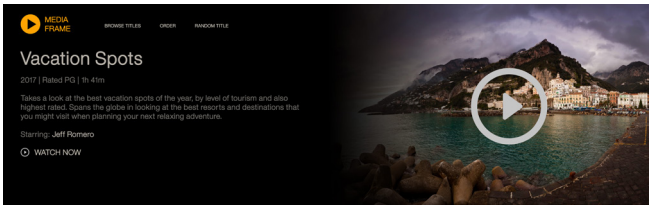
The benefit of metadata for video can be quickly realized when you consider a simple, typical search query. A written article can be "search engine friendly" just from having a body of words to match a search term against. Video is different -- it's often a combination of images and audio that form a single asset. Metadata can therefore add that much-needed context, from associating transcripts to custom descriptions, that help people, whether they're end users or media managers working in a production workflow, discover content that is highly relevant to them.

Scouring through written article after written article can be time consuming, but there are tricks to search inside a document to speed this up. Video has not typically had a similar technique, and asking an end viewer to watch through hours and hours of content is not feasible. Consequently, deep augmented metadata aids the discovery of relevant content and helps to make video assets infinitely more accessible to viewers as opposed to large asset libraries of unsorted content.

Different Types of Metadata

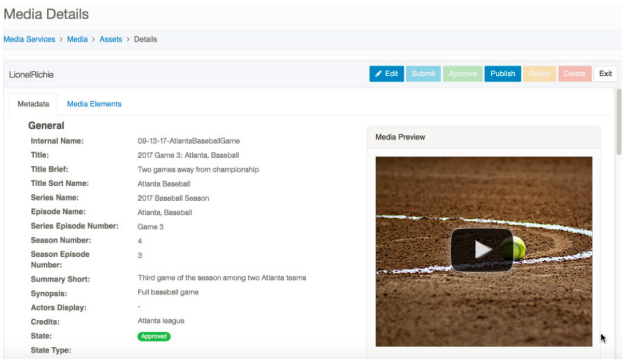
There are three main types of metadata, each with a slightly different use case and often focused toward content accessibility.

- **Descriptive Metadata**
  This type of metadata includes information such as the title, author, abstract and relevant keywords. This is the common association of metadata and aids in content discovery and identification.



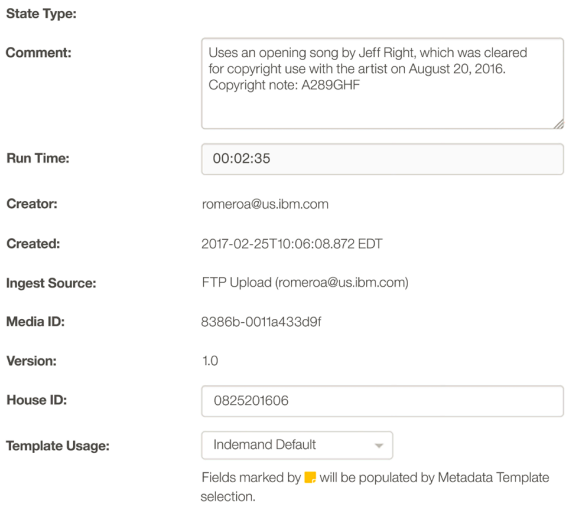
Sample of descriptive metadata translating into visible text for end users

- **Structural Metadata**
  Metadata that falls into the structural type is intended to show a big picture on how content is associated with other assets. For example, it might note that this video clip is chapter 2 of an 8 chapter course. As the name implies, this data defines a structure for the content and guidance on relationship to other elements.



Sample of structural metadata

– **Administrative Metadata**
  This type of data is used to help manage a resource, sometimes used to dictate access rights or document background information on the asset. Examples of this would include citing intellectual property rights, information such as creation source, and dates regarding creation or milestones. Because the two administrative metadata use cases can be diverse, this type of metadata is sometimes broken down into the subset of “rights management” and “preservation”.



Sample of structural metadata

Use cases for metadata can extend far beyond these listed. For example, the price for subscription based content can be managed from this information. In fact, using IBM Watson Media, even the act of transcoding can be tied to metadata. In this example, specific metadata fields allow video-processing workflows to be dynamically created on a per-content basis. These processes can be based on any conditional values that might be found in that asset’s metadata. For example, if the high definition (HD) flag is selected, a standard definition (SD) version of the video will not be generated by the transcoding service. This approach saves time in terms of transcoding, but also resources in not having to save unwanted copies of files – and saves money on both storage and transcoding fees. This process can even be used to break up “premium” and “free” content; for example, creating a setup where ad free high definition versions of an asset are created alongside a 480p version that contains pre and post roll ads, all based on conditional values found in the metadata.

The Long Term Value of Metadata

The initial development and continued maintenance of metadata integrity can be time consuming. Metadata is a long term investment, though – it’s a way to optimize video content to ultimately boost the ROI (return on investment) of each individual asset. Here are seven key benefits of emphasizing metadata as part of your video strategy:

– **Extend Content Longevity**
  It’s typical for new content to be highlighted over old. In large content libraries, though, this can lead to older assets being less visible and by extension harder to access. Metadata can aid in the discovery of these assets, helping end users find relevant video content and thereby extending the longevity of those assets.

– **Adding Context**
  Why was this video created? What purpose does it serve? Metadata can be a quick way to add this context and present it in a way where it will accompany the video. This process can add valuable information especially as elements around the asset might depreciate. For example, a video might have launched as part of an article or as a series, but might live on as a prominent asset long after those other assets start to fade. In this example, the metadata would help explain a bit of background on the resource and avoid viewer abandonment that might have been caused without this context.

– **Increasing Relevance**
  Sometimes metadata can present value that would otherwise have been missed. Great examples include learning about the staff who worked on a video and having this data easily searchable. For example, a viewer might find more value in an asset if they learned that a certain director was behind it. While that level of detail might be front and center for a movie, it can often be buried in serialized content. Metadata can quickly highlight this detail to increase asset interest.

– **Maintaining Historical Records**
  Metadata can also offer a central location to document details surrounding an asset. Did it use copyrighted music? Was stock footage borrowed from another source? Information about this can be associated with the video, creating a structure that makes this information more accessible while creating a timeline for the asset.

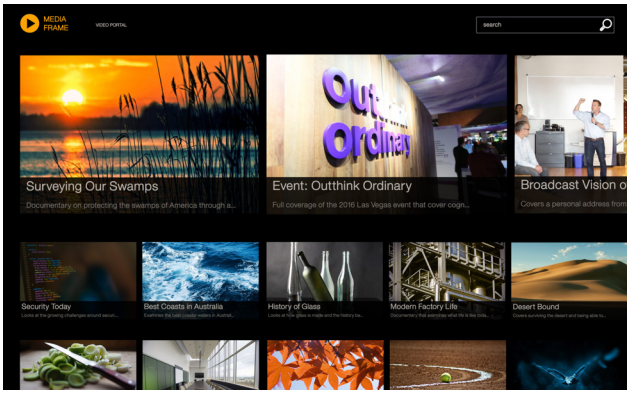
– **Documenting Production**
Metadata can get very granular in the level of detail included. It can be as high level as image resolution down to very specific camera details like aperture, frame rate, shutter speed and more. By archiving these details, people later can reproduce similar setups to match the look for additional content created in the series.

– **Resource Efficiency**
Not all video assets need the same derivative versions created from them through transcoding. Maybe a resource should only be available with a high definition version, while another should be offered with a wide range of transcoded versions to maximize compatibility across connection speeds. By controlling the transcoding through the metadata, this limits the number of derivatives created based on what works for your business, saving storage space long term. Metadata can even be used to disable transcoding altogether on a resource, setting it up as a pass-through asset, if the encoding of that file has already been meticulously configured before upload and there is no desire to create lower definition versions or to conform to compatibility specifications.

– **Business Intelligence Across Internal/ External Functions**
In the media and entertainment industry, a movement is afoot to create persistent, canonical, unique identifiers for virtually every video asset – The Entertainment Identifier Registry Association (EIDR) is a not-for-profit industry association that was founded by Movielabs, Cablelabs, Comcast and TiVo to create unique IDs for any given asset. What problems does this solve? Imagine being able to marry data from rights management systems, content management systems, distribution services, digital rights management services, and financial reports back to an asset easily by having one unique ID flow through all those systems for an asset. This dramatically reduces the burden to perform proper business intelligence for a body of video assets.

Building a Metadata-Driven Video Strategy

Metadata is an important element of a video strategy, and becomes increasingly important as asset libraries grow.



Sample of structural metadata

As a result, the IBM Watson Media Logistics Manager includes a robust metadata engine that features a Metadata Processing Rules (MPRs) toolset. This toolset can be applied against a variety of metadata structures where the taxonomy has been defined. Custom fields can also be verified, manipulated, added, or even removed, provided the path to the specific element and the element's attribute structure are known.

This metadata information is often found in an Extensible Markup Language (XML) file that is associated with the video. This can be an Asset Distribution Interface (ADI) XML or a Media RSS (MRSS) file, and will have a specific format depending on the type of XML that is being parsed, i.e., when you are manipulating a metadata tag or field, part of that field name is comprised of the XML path to find that tag. For example, ADI files have a set of Asset Management System (AMS) tags that are found within each stanza. MRSS files, on the other hand, have a defined set of values. This location is important as when creating the MPR toolset you need to specify the field location by providing the field's path so it knows where to apply those rules.

To help with this process, IBM Watson Media uses a customer defined metadata template, also called a schema, as a code assist tool. This schema comes into play when configuring an account. Any schemas you expect to parse and edit with rulesets are uploaded into a table which can then be accessed by the engine when creating the rule. After being implemented, this system will return the next possible tags within the schema that can be selected, ultimately helping you build a path to the desired field.

This process makes it easier to manage your video data, applying rules to metadata to add, update or remove information contained within.

Managing Video Metadata

There are three supported actions that can be applied to asset metadata, each with various options associated with them. Capabilities include being able to replace entire fields or insert, remove, and change part of the value listed. This methodology can aid in keeping metadata information up to date. Processes also work around the concept of helping speed up and simplify future asset maintenance. These three actions are:

- **Set**
  This action replaces an existing value in an XML file. A sample of this would be:

  IF Product is MOD, SET Suggested_Price to 3.99

- **Add**
  This function can be used to add a new tag or element to the XML. Some examples of this would include adding new categories to an asset or adding an entirely new custom field. A sample of this would be:

  IF Provider is Basketballtalk, ADD Category All Sports/Basketballtalk/

- **Remove**
  This will delete an entire tag or element within the XML. For example, custom fields that are not accepted downstream for some targets can instead be removed on a per destination basis, helping with faster synchronized updates later on. Another example would be if a category exists that does not follow the structure of the target affiliate, making it ideal for removal. Part of this action will involve specifying what tag or field should be removed. A sample of this remove function would be:

  IF Product is MOD AND Provider is WRSS apply REMOVE WHEN Name is SCHEDULED_TO_RUN

  In the above sample, this remove action would only be applied to tags that have the name SCHEDULED_TO_RUN in them. The remove function can be more sophisticated, though, by removing tags that do not match specific values. This can be done to unify data across similar categories of content. A sample of this:

  IF Series_Name is Adventurers, apply REMOVE WHEN Name is Category AND Value is not All/ Adventurers OR ALL/Series/Adventurers

In these actions, value case, such as upper or lower case, inside metadata can be ignored during matching. Alternatively, values can be set to all upper or lowercase to create a more uniform experience for future updates. To synchronize content, the variable function can be used to enable one field to set or replace the value found in another field, or specified values can be prepended or appended to existing data. This can help if, for example, a series of related content is created and there is a desire to add metadata from an earlier asset in that series.

Ruleset Groups

Within the Web-based UI that IBM Watson Media offers, account managers and planners can utilize these MPRs to control the data surrounding their video assets. Once created, these rules are organized into a group that can be applied at ingest, at time of schedule (if media is owned) and at distribution (if destination is owned).

These groups create many small, malleable rules that can be applied to video assets in the desired order and in different groups. This process avoids having to recreate one large ruleset multiple times with slightly different flavors for different content – a key feature to streamline clients' video workflows, especially where distribution to third parties is a part of the business model.

Robust Metadata Management

Metadata is an important element of a video library, adding much needed context to increase discoverability, while also offering a powerful way to manage assets with greater control. Through IBM Watson Media, metadata management is simplified, offering flexibility to keep information up to date, and to manage mass updates intelligently to a series of content.

Find out more by visiting: http://www.ibm.com/software/products/en/logistics-manager

About IBM Watson Media

Created in January 2016, IBM Watson Media brings together innovations from IBM's R&D labs with the Watson Media platform capabilities of Clearleap and Ustream. Through the unit, IBM delivers a powerful portfolio of video services that spans open API development, digital and visual analytics, simplified management and consistent delivery across global industries. IBM Watson Media supports top media and enterprise companies with reliable video on-demand and streaming services.

For more information on IBM Watson Media, please visit www.video.ibm.com.

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