In the increasingly complex media industry, content has a challenger for the title of “king.”

Metadata — information about all of the elements that make up a piece of video — is now in competition to lead the industry into the future. It’s playing an increasingly powerful role in video, alongside the creative and finished product itself.

The industry’s realization of the importance and value of metadata has been growing: A recent Pay-TV Innovation Forum 2017 survey of pay-TV providers found that the majority of pay-TV executives believed data and analytics would be crucial to the direction of pay-TV over the next five years.

Metadata use is growing because it helps content producers and distributors adapt to changing business requirements, build greater efficiencies, optimize content slates and revenue, and create more relevant experiences for consumers. These companies realize that staying connected to a video throughout its lifecycle brings richer insights and rewards. Metadata forges that connection, so it has taken on a critical role as companies strive to produce a cavalcade of content and deliver it quickly into markets where they’re vying for virtual shelf space and trying to meet consumer desires for more personalized viewing experiences.

Thus, metadata is guiding content companies — and by association, consumers — into the future. It helps content producers with critical business functions at every stage:

♦ organize, track and analyze assets from concept to consumption
♦ speed video to market and free up capital for reinvestment
♦ reduce content costs
♦ raise productivity and creativity
♦ create dynamic, intelligent video opportunities through artificial intelligence
♦ enable deeper consumer search, discovery and personalization
♦ drive revenue and ROI for new and library content

Technologies such as media logistics platforms, which are driven by metadata to support media operations workflows, are changing the video business at its core. And, when media logistics is integrated with a similarly data-driven online video platform, the holistic benefits of metadata for video can be fully realized. These Integrated Video Platforms (IVPs™) are making production and distribution workflows more efficient, adding intelligence to video, personalizing consumption and affording greater returns on content investment.

This white paper will explore metadata in more detail — what it is, how companies are harnessing it deeply throughout the lifecycle of video today to build value for their media assets, and how it’s already shaping the video of tomorrow and staking a claim to the media industry throne.
THE STORY OF METADATA

The story of a video begins and ends with the metadata attached to each element contained within it. And there are many different types of elements that companies need to work with to produce, distribute and measure a video during its life journey.

Which assets need metadata?

To begin with, metadata needs to be defined for the many different types of assets that can be used to produce a single piece of video content:

- **media assets** - e.g. a video clip for a TV episode
- **image assets** - e.g. a photo for that episode
- **text assets** - e.g. subtitles for that episode
- combinations of these, or **group assets** - e.g. a video clip with subtitles for that episode

Metadata definitions are also needed for **business objects**, which enable modeling of an entire video business, not just media operations. A business object hierarchy can be anything that a business needs to identify and manage its video content, such as a:

- sport, season, team or player
- program, series, episode or version
- contract, script or work order

For example, a TV series would be a root object and a specific season, episode, or script from that series would be object levels mapped to that.
What types of metadata are there?

To break things down further, there are several types of metadata that video producers work with across assets and business objects:

- **asset metadata** contains information on the complete audio-visual file, image file, text file or group file - e.g. the files for a specific episode
- **business object metadata** contains information on business objects, such as productions or series - e.g. a contract for a specific season
- **temporal metadata** contains information on specific timecode in and out points in an audio-visual (AV) asset - e.g. data about a soccer goal, such as who scored for which team
- **spatial metadata** contains information on areas of an image or AV file - e.g. a sponsor logo on an ad
- **event metadata** contains information on automated actions and operator tasks - e.g. when tasks started and ended, and what or who performed the tasks

These various types of metadata are used to apply actions against assets and business objects such as locating, importing, analyzing, and making decisions about them.

**TYPES OF METADATA**

- **Asset Metadata**
- **Business Object Metadata**
- **Temporal Metadata**
- **Spatial Metadata**
- **Event Metadata**

Unlike traditional asset management systems such as MAMs, PAMs or DAMs, media logistics platforms such as **Ooyala Flex** can import, input, manage, transform, analyze and export all of these types of metadata. This information can be accessed throughout workflows, including:

- asset genealogy - e.g. parents and children
- technical metadata - e.g. file format or video and audio stream information
- metadata held in a custom metadata definition - e.g. date range for a specific event
- metadata on the history of asset activity - e.g. which team members handled it

**THE USES OF METADATA**

How can metadata be harnessed throughout the video journey?

Metadata is created and used from the very beginning of a video’s life all the way to the end. The integration of modern media logistics platforms and online video platforms has now transformed this entire journey and highlighted the abilities that metadata has to enhance video workflows, reporting and performance.

**Ingest, Import, Validate and Manage**

At the start, a media logistics platform automatically captures metadata from the various types of assets (such as raw video footage, multiple audio tracks, images and timed text) as they are input into a video production system, assesses that metadata and logs it. The assets can come from many different sources, whether newly ingested from an in-house production team or imported from third-party systems. These initial platform actions alone solve for what has historically been among the most problematic steps for producers: manual metadata input, which is rife with errors and waste, and can make it hard to find assets. For instance, with a media logistics platform, video elements can be transcribed automatically based on their metadata, instead of manually at a substantial cost of time and resources.

One producer has noted that for each hour of content, it takes them four hours of manual labor to enter transcription metadata. Automating this process cuts that down dramatically.
A standard metadata design tool within the platform enables companies to catalog, create and define the metadata that needs to be held for their particular types of assets contained within, and associated with that footage (e.g., news video, entertainment video, new images or text). Automated business logic and user-defined rules can be set up to determine how teams should treat assets and their metadata throughout subsequent processes. They can also track hierarchies for their particular assets and business objects. With today’s advanced data modeling, companies can model and track metadata by setting up the relationships between existing business objects to quickly search, group, update and share them.

**MEDIA LOGISTICS**

From there, metadata is synchronized, and customized actions, tasks and workflows can be designed for all of these elements as they progress through production, post-production and syndication to form a finished video. Metadata structures from external sources can be imported, and custom metadata search fields, such as a custom thesaurus or keyword list, can be added. For each metadata field, companies can validate the content allowed there and who has permission to access it — whether to search, view, approve or edit it. For example, a team may want to limit who can see video licensing terms or talent salaries, edit review notes, or modify production line item budgets.

At each point, the various types of metadata are utilized. For example, spatial metadata can be used to highlight a section of a video frame that needs modification before being approved. Event metadata is stored so teams can view a history of automated actions, or of human tasks made against an asset, and then run reports.

Unlike traditional asset management systems, media logistics platforms can model asset and object relationships so that in-depth, real-time and historical searches can be made on any asset or business object metadata at any point in the video chain — whether as a video is being assembled or as it’s being repurposed later in life. For instance, contract and budget business object data can be easily tracked and pulled from legal and finance systems as needed. Elastic search is a more recent advancement that enables users to index and search diverse file types so that results for items such as budgeting objects, scripts and final videos associated with search terms can all be captured in one query.

With a focus on automation, media logistics platforms help solve issues stemming from a lack of metadata standardization and continuity, such as when disparate systems within a workflow are used. This situation has long been a problem for traditional asset management systems; because they are siloed, they can’t reach out across operations and cannot seamlessly connect their
metadata to them, either. They may struggle with managing multiple metadata schemas across assets and recovering from metadata loss: Each system contains its own metadata, which is often structured differently, so when teams pass files between different systems, some key metadata may be left behind. Media logistics ties metadata together into a separate data layer so it’s connected, available and visible to users at all times. Teams even can access metadata before receiving files for better workflow planning.

Generating as much metadata as possible, and extracting it easily across different systems, are becoming key ways to build greater workflow efficiencies and insights, and maximize the use of new and archived content. A media logistics platform can make this happen: Teams can use metadata tracked through the platform to find and curate clips from a full-length film or event, assemble modified local versions of television series, or develop new multi-platform shows that can be monetized for various distribution windows, business models and markets.

Ooyala Flex, working with Microsoft Video Indexer, part of Microsoft Cognitive Services, also automates metadata extraction from videos to boost efficiency via artificial intelligence (AI), which now offers a deeper connection to metadata than was previously possible. The system can pull audio transcripts, detect faces within videos, and analyze text to identify key topics. This kind of enhanced information housed in metadata makes it much easier to locate a video asset, determine what it contains, and take immediate action on it.

An editing team working on hours of raw documentary footage can vastly speed up their production process by automatically identifying participants’ facial and emotional reactions. They can automate speech-to-text transcriptions and object identification to locate specific scenes and moments. AI can also be used to identify individual talent in a program clip and potential product placement revenue opportunities within it.

**Transcode, Package, Distribute and Archive**

Metadata also provides critical assistance to asset transcoding, packaging and transformation into final formats for distribution. Based on the automated metadata input, pre-defined translations can be performed against assets and business objects — regardless of their origin, converting them into the correct formats and packaged in the way that distribution partners require.

A SVOD partner may mandate certain quality control or format guidelines; if an asset and its metadata don’t meet either of those requirements, media logistics can easily locate the metadata and automate the quality control or transcoding process for compliance with that particular partner. Or, a finished TV episode may need to be modified for licensing to international markets or for specific distribution windows. Metadata can be used to track real-time, detailed information on a show episode, such as length, language, keyword description, music and creative team, to alter that information as needed, and then to map that episode to the season and series in which it belongs.

When it comes to archiving content, librarians can also reduce their manual logging workload and process significantly more content in less time. With media logistics, metadata archive rules can be set up so that when assets contain a specific topic, personality or location, an archive process is automatically triggered, including email notifications to the production team.
**Publish, Discover, Personalize and Monetize**

As a video continues on to being published and monetized across screens, this same video metadata is synchronized and used by an online video platform, such as the **Ooyala Video Platform**, integrated with the Ooyala Flex media logistics platform. The Ooyala Video Platform can similarly harness metadata for seamless integration with a holistic ad management and programmatic trading platform, such as **Ooyala Pulse**, for intelligent ad delivery. This unified path makes it easier to connect assets to final audience playback, performance, and revenue optimization.

Integrations with a company’s own CMS offer full visibility into the process. Here again, teams can determine the specific labels and metadata requirements to ensure consistency. For example, metadata is used within a video platform’s CMS workflows to determine specific content restrictions — such as licensing windows — and remove or flag content accordingly.

Discovery and personalization are two growing areas for metadata use. The content recommendation engine **Ooyala Discovery**, which is part of the Ooyala Video Platform, harnesses the metadata captured and processed in Ooyala Flex (and subsequently stored in the Ooyala CMS) along with the analytics of **Ooyala IQ**. It combines them all via powerful machine-learning algorithms to provide content selections for viewers and heighten their connections to it. The engine provides full editorial control while the algorithms can filter content based on metadata-based rules set by a company.

This process surfaces more precise relevant content that gives viewers what they’re looking for, and is increasingly being used to deliver more targeted, relevant and personalized ad experiences. With AI, tailored automatic insertion of pre-roll ads can be done based on who appears in a video that was processed earlier in a production workflow for face recognition. So, for example, an interview with a singer can be identified from a magazine-style TV program; this segment can automatically be preceded by a quick advertisement for a new album featuring that singer.

Matching consumer preferences and expectations ultimately keeps them around longer to deliver more revenue back to a provider. Dish Network, for one, has integrated TiVo’s **localized metadata** for TV program information and image-based content to surface popular content, identify spikes in audience interest, and enhance relevant search results and recommendations on the provider’s multiple platforms.

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**Report and Analyze**

Accessible metadata gives companies greater metadata continuity throughout the video cycle. That means more reporting opportunities and connected insights that aren’t possible from systems lacking a continuous data flow across asset activities. And, all of this information can be kept forever in an audit trail.

Teams with media logistics platforms use analytics dashboards to view events metadata in historical or real time to answer questions such as:

- How many content versions are we creating for a specific partner?
- How many team members are handling an asset?
- How much time does it take to complete quality control for one video?

This knowledge can rapidly solve system breakdowns, bottlenecks or other issues that delay operations. Metadata can also be analyzed to understand which syndication partners are the most successful, and discover new ways to improve processes and delivery time to those partners. This information can be matched against revenue figures to measure the impact of content delivery.

As a video journeys from media logistics through an online video platform, the same video metadata is used to improve workflow activities at every turn — from content protection...
and billing to playback, user experience and monetization. **Ooyala Live** within the Ooyala Video Platform also utilizes metadata for live event monitoring and rapid live-to-VOD asset conversions. Again, companies use analytics dashboards to view historical or real-time video metadata that help solve puzzles such as:

- What content can and should we be delivering to audiences in specific countries or on particular devices?
- Why are audiences leaving a video before it finishes?
- What content is driving the most engagement or revenue?

With Ooyala IQ analytics, for instance, content teams can use metadata to track how their published videos perform against various segments, such as with audiences in Spain vs. Australia, on mobile vs. laptops, or on one digital property vs. another — all with multi-dimensional audience details and viewer metrics. This knowledge can then be used to direct future content investments and creative approaches.

Companies can harness metadata to analyze video performance in real time or historically — to make smarter decisions about what content to produce, how to distribute it, and how to boost viewership, engagement and monetization. Thus, descriptive data becomes *predictive* data.

Having connected metadata from IVPs ensures that the questions companies pose early in the life of a video, such as how many local market versions are being created, can be directly mapped to those considered later, such as how those versions are performing in each market. Or, how the time it takes to complete a critical step in the production process can translate into how a video performs with audiences. For example, teams may find that after applying a new, more rigorous content review process in production, consumer engagement in the Comedy category went up 20% or similar. An end-to-end feedback loop is created, which harnesses metadata generated at the beginning of the video lifecycle to inform and improve activities all the way to the end of it, and back again. At any point in the process, metadata provides companies with full visibility into their operations, and a single source of truth.

IVPs also create a centralized view of metadata and dynamic management of it that ensures visibility, control and continuity along the entire video asset journey. In these ways, metadata used throughout integrated video workflows helps companies:

- manage resources more efficiently
- make better decisions and investments
- create better audience experiences
- see a greater return on those investments

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**Case in Point: ZoneTV**

**ZoneTV** is utilizing media logistics tools from Ooyala plus Video Indexer, part of Microsoft Cognitive Services, to automate the curation of content of a first-of-its-kind, customizable suite of linear TV channels, which launches this fall.

ZoneTV has licensed digital-first content which it will curate into specialized channels delivered to pay-TV subscribers. For consumers, these channels will initially appear like any traditional linear channel. ZoneTV’s unique service allows consumers to do more, combining linear, on-demand and customized choices into a new offering called ZoneTV Dynamic Channels. The company’s ability to curate 6,000 hours of videos on the fly in these channels creates a unique and personalized experience for the consumer.

The content in the specialized channels will be presented in a consumer-friendly, easily discoverable way to viewers. ZoneTV will achieve this using the ZoneTV Programming Studio, which is integrated with Ooyala Flex and with Video Indexer to curate fine-tuned specialized channels.

The combination of these tools features advanced algorithms that characterize content; the platform automatically extracts and analyzes metadata to identify video genre and content sentiment, pulls topics from speech and text, translates captions into multiple languages and integrates subscriber analytics. This provides quick scalability for ZoneTV as it adds additional content, and reduces manual processes that can slow content curation and introduce errors in metadata translation and application.
THE FUTURE OF METADATA

What will metadata be able to provide going forward?

New metadata advances are coming to the forefront every day.

Currently, one of these surrounds temporal metadata. Companies working with existing assets or with growing live files have a rising need for metadata entry support against a precise media region, such as a brief 20-second highlight clip within a 2-hour sports match. Advancements in this area will allow companies to populate and customize fields with both manual and automated temporal metadata. During live sports events, metadata on growing files can be logged and defined as events unfurl. This richer metadata and enhanced contextual search can then facilitate more rapid asset discovery for all aspects of the video chain, in addition to providing greater contextual value to recipient partners.

Along with continued advances in AI services for harnessing metadata, emerging voice-activated technologies like the natural language processing used in Microsoft Cortana, part of Microsoft Cognitive Services, are also tapping into metadata for enhanced contextual search that can increase content engagement, consumption and user experience. Voice transcripts during metadata entry and production are also being used to increase workflow efficiencies and will only get more accurate as voice recognition systems continue to improve.

In addition, global content translation is improving with multilingual metadata. For example, Microsoft Translator, part of Microsoft Cognitive Services, offers the ability to search in one language, such as English, and read in another, such as Polish.

The possibilities for metadata use are vast. Indeed, companies like CNBC and Viacom are among the many that are finding new ways to use metadata and drive value for their media assets every day.

THE VALUE OF METADATA

How does metadata create value for content producers and providers?

Metadata has become the core component of video today and tomorrow, driving more opportunities for content efficiencies, engagement and monetization, and making a future case for the moniker “king.”

Ultimately, metadata enables producers and distributors to achieve more powerful asset management and business performance at any point in the life of a video.

- Assets can be searched and located more rapidly, and tracked throughout their lifecycle
- New types of assets can be correctly and automatically packaged for new delivery platforms
- More efficient and cost-effective automated workflows can be designed
- Intelligent video opportunities can be created through AI
- Smarter business decisions can be made based on metadata analysis
- Operational, financial, playback and ad performance can be traced to a single point of truth
- Content development and licensing can be improved
- Consumer search, discovery and personalization can be honed
- ROI can be increased

Metadata is the fundamental link that connects video, systems and people together.

“We are trying to take a unified approach to metadata but our organic growth has meant several different approaches to integrate. We are continuing to develop as we see metadata’s importance and the only real way to realise the true value of the asset.”

– Major International Sports Broadcaster

The Lifecycle of Content: From Production to Monetisation
For over 10 years, Ooyala has been at the forefront of shaping the content supply chain revolution as a leading provider of OTT, content production, and digital distribution solutions. Ooyala powers linear and on demand video for the world’s largest companies, managing thousands of hours of content and serving billions of streams across all platforms. With its open APIs and vast partner ecosystem, Ooyala Flex Media Platform provides a single source of truth for managing metadata and workflows of media companies. The Ooyala Flex Media Platform enables content creators and distributors to become more agile and cost efficient by automating tasks, simplifying workflows and reducing time-to-TV-grade experiences across all screens. Ooyala has offices in the Silicon Valley, Chennai, Dallas, Guadalajara, London, Madrid, New York, Singapore, Sydney, Tokyo, and sales operations in many other countries across the globe. For more information, visit www.ooyala.com. For inquiries, contact us or email sales@ooyala.com.