

Transforming Entertainment Through Technology

Measuring efficiency gains in digital content distribution.

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Abstract: In the new world of media and entertainment distribution in the digital age, a key landmark was reached in August of 2010 with the formation of the Entertainment Identifier Registry, or EIDR, by founding members MovieLabs, CableLabs, Comcast, and Rovi. EIDR provides a Universal Media ID for movie, TV and other audiovisual content. EIDR's mission is to drive out inefficiencies in the supply chain, enabling new business models and workflow processes to support the increasing opportunities and complexities in the digital distribution of content.

The Entertainment Identifier Registry (EIDR) supports its mission by providing not just standalone IDs, but linked sets of IDs that can identify not only a work, but also all of its versions, encodings and related content. These identifiers are backed up by a network-based API that is used to create IDs, discover IDs, retrieve the underlying metadata and follow connections to other identifiers (such as finding a TV Series from the H.263 encoding of an episode, or finding the Spanish-language director's cut of a movie based on the identifier of the U.S. theatrical release). Finally, EIDR supports the inclusion of identifiers from other systems, allowing interoperability across systems that use legacy identifiers.

In the summer of 2013, the EIDR consortium numbered close to 50 member companies, with new members added every

month. Some key members, including Microsoft, Google, and Vudu, are working with studios to define a standardized architecture for digital content distribution and retailing.

This paper explores the value of using an EIDR global unique identifier in the media and entertainment industry supply chain, with a focus on how using a standard content identifier automates and streamlines digital delivery. This paper summarizes a use case that has already been implemented and deployed by EIDR members Warner Bros. and Microsoft on the Xbox Live platform.

Laying the Groundwork

Since the founding of EIDR, all the major studio members and many other supply chain members of the EIDR consortium have engaged in many different implementation exercises. Some examples are given in Table 1 on the following page.

Table 1: EIDR Use Cases

ID CREATION	
Registry Seeding	Participants generate EIDR IDs for existing catalogs. Participants include content owners, metadata suppliers, and film and television archives.
Title Management	Content producers create EIDR IDs at the start of the production cycle, ensuring that the work always has a globally understood unique ID.
Catalog Matching	Existing catalogs are matched against the EIDR database. EIDR IDs are applied to the records in the source database and useful identifiers from the source database are added as EIDR Alternate IDs.
DISTRIBUTION AND METRICS	
Cable Video on Demand	The EIDR ID is used to coordinate assets and metadata from multiple suppliers.
UltraViolet Distribution	EIDR IDs streamline the process of providing the right version of a video asset (HD, SD, with subtitles, etc.) to a specific customer on a specific device.
Uniform Reporting	EIDR is used to track and aggregate box office results for films in theatrical distribution and measure uptake in on-demand systems.
Music cue sheets	EIDR IDs are included in music cue sheets, providing greater certainty than traditional title-based cue sheets when managing music royalties for a video asset and its different versions.

Warner Bros and Microsoft have collaborated to pioneer a new class of EIDR implementations. The pilot covers new release theatrical titles owned by Warner Bros and ordered by Microsoft for sale in the online storefront on Xbox Live. The goal of the pilot was to use EIDR identifiers and APIs to address manual process steps that resulted from a lack of a unique product identifier across the content ordering, delivery, and reporting processes between Warner Bros and Microsoft. These manual steps introduced cost, error and delay into the process.

Several Warner Bros. departments participated in the pilot. The Avails group researches available titles and announces title lists to customers. The Data Servicing team manages Warner Bros.’ master data system and requests EIDR IDs. Digital Distribution Operations manages and supports the outbound digital supply chain, and Distribution Services/DETE manages orders and creates and delivers the digital assets ordered by the retailer.

On the Microsoft side, the Content Management and Operations group manages the

receiving side of the system. The group processes the avails list, orders titles, receives and validates the digital assets, pulls in metadata from various sources, and provides sales and royalties reporting.

The existing system had a great deal of manual collation, review, and decision making within the two companies as well as for the multiple communications between them. The pilot was designed to address a number of key issues raised by this:

■ **MANUAL COMMUNICATION BETWEEN STAGES OF THE PIPELINE:** Each stage in the pipeline takes data from the previous stage, and so each stage has a data ingestion and import component. Matching assets to data throughout the workflow has generally the same issues at each stage of the pipeline as it does at the endpoints – human review of assets and data, manual collection of data from multiple sources, etc. The most obvious example of this is what is traditionally called ‘ingestion’ – the receipt by one party of an asset delivered by another.

■ **MANUAL QUALITY CONTROL:** Assets

delivered from Warner Bros. to Microsoft must be identified manually since the same movie may be delivered in multiple versions. Other digital workflows (for example digital cinema) address this by standard naming conventions for files, but that is a suboptimal solution to the problem.

■ **ASSET QUERIES:** It is difficult to reconcile delivered assets with only title information. For example, the title alone will not provide information about whether the delivered asset is a modified or censored version, what audio and subtitle tracks are available, and so on, all of which are essential for retail presentation.

■ **CUSTOMER QUERIES:** Responding to retailer inquiries and maintaining data logs and spreadsheets is bogged down by the need to collate and sift multiple data sources.

■ **CONSOLIDATED REPORTING:** Manual searches across multiple sources of data for Product Performance Reporting, Asset Delivery Metrics, Tech Ops Invoicing, etc. are time consuming and error-prone.

EIDR was used in all of these situations,

from the publishing of avails all the way through the ordering, sales, and reporting process. The common theme at each point was to take advantage of the reliable unique identifier to remove the human element in matching and collation and, when necessary, use the API behind it to support more complex tasks.

Pilot Planning

There were several set-up activities and decisions that had to be considered for a successful implementation. The most important were scope planning, data structure planning and preparation, and the actual integration of systems and work flow.

Scope planning is common across any IT project, and includes appointing a leader and sponsor for the initiative, deciding on the scope of the project, determining which work-flows will be involved, and conducting regular planning and status meetings.

Planning and preparing the data structures for the EIDR pilot had several components. The backbone of this is the integration of the EIDR ID into end-to-end processes. At a high level, this includes generating EIDR IDs for the video assets at both title and version level and including the EIDR ID in the avails and metadata provided by Warner Bros. to Microsoft, the orders placed by Microsoft, the asset files delivered to Microsoft, and the point of sales reports returned by Microsoft to Warner Bros.

Because some of the titles being made available were from back catalog (that is, before Warner Bros. started to generate an EIDR ID for each new title), other EIDR members had registered EIDR IDs for many of the titles to satisfy their own business needs. Hence, the titles needed for the project had to be matched against the EIDR database to see if they already had an EIDR ID. If not, they had to be registered.¹

The last planning step was to design the system to communicate EIDR IDs to Microsoft in the avails so the IDs could be used for ordering and reporting.

Pilot Implementation

Integrating the systems and workflows had several components. The first, of course, was to document the existing process and the detailed work plan for the technical integrations.

The pilot required two new integration points within Warner Bros. First, a new in-

terface had to be designed to obtain an EIDR ID for all new titles and apply the ID in MSB (the Warner Bros. Metadata Management System). This was similar to many other existing EIDR integrations and used standard EIDR APIs and practices. Second, the interface between MSB and the Digital Avails Portal had to be updated to provide the EIDR ID for the avails, allowing Microsoft to use EIDR IDs when ordering and reporting back to Warner Bros. This required modifying the avails list to include a spot for the EIDR ID and involves a process any IT organization will be familiar with.

Both of the integration points can be used as-is with future digital distribution partnerships, and so are a one-time cost.

Making the EIDR ID truly pervasive required touching several systems and protocols

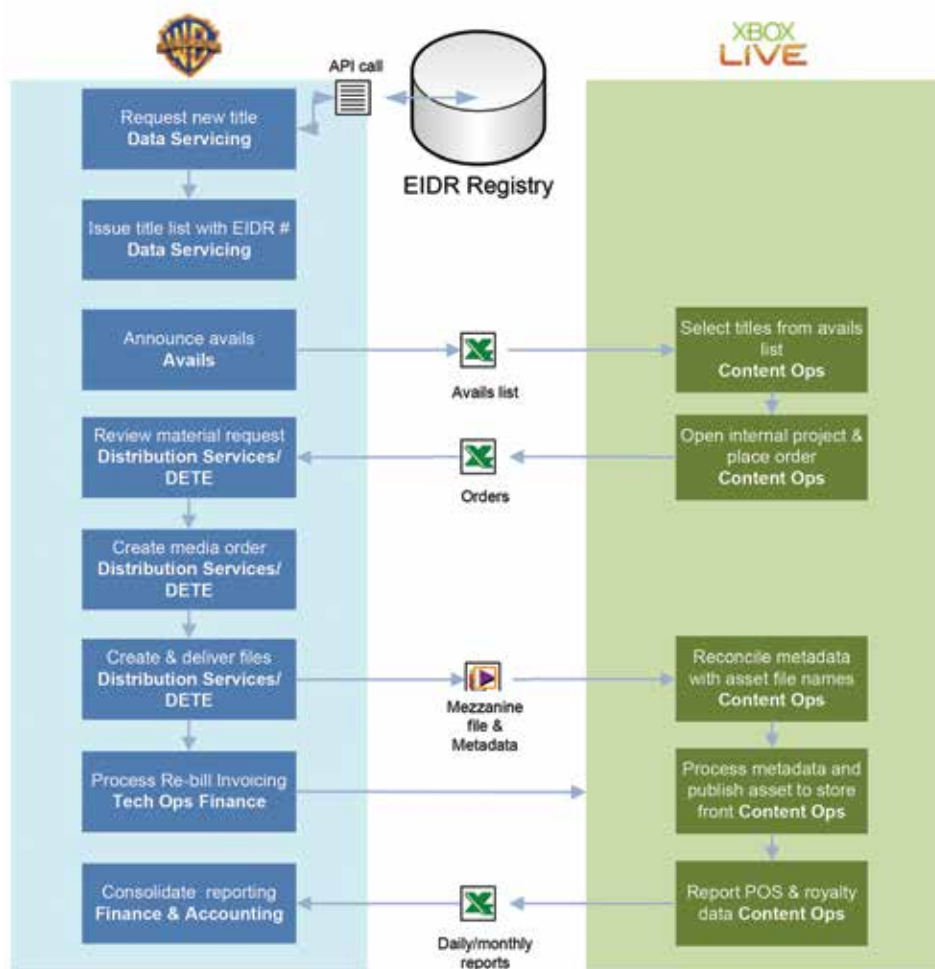
within and between the two companies. It had to be included in the avails list, all meta-data communication, and files and file names to enable coordination of the multiple phase of the pipeline.

Although the initial pilot continued to use some spreadsheets, the inclusion of EIDR IDs in those spreadsheets reduced the time, effort, and errors associated with manual matching of titles and versions. The presence of the EIDR ID in the transactions paves the way for full automation of many of the communication paths.

Case Study

After the pilot was deployed, Cognizant was commissioned to work with Warner Bros. and Microsoft to write a case study that analyzed the costs and benefits of the

EIDR IDs for Warner's Back-Catalog



¹Warner Brothers is currently working on a project to get EIDR IDs for their entire back catalog. Once that project completes, this step will no longer be necessary for them.

Summary of Realized Benefits

PROBLEM	SOLUTION	SAVINGS
Manual Communication: Asset Ingestion/Manual Quality Control	Use EIDR ID for avails, ordering,	270 hours/year per partner
Manual Communication:	Use EIDR ID for ordering, delivery, and delivery confirmation	375 hours/year per partner
Delivery Reporting/ Asset Queries	Use EIDR ID for avails, ordering, Customer Queries and delivery	7 hours per year, plus fewer distractions in day to day operations

approach. Cognizant worked with both companies to identify participating departments, key contacts in each department, and the affected workflows and processes. After initial meetings to understand the previous and EIDR-based processes, questionnaires were created and customized for each department to capture the following information:

- Initial investment activities and efforts for planning, data preparation and integration of EIDR into the workflow.
- Workflow changes and corresponding qualitative and quantitative benefits from EIDR.
- Additional benefits realized including elimination of spreadsheets, organizational improvements, or lower vendor fees.

Finally, the case study collected information about any hardware and software costs required to support the EIDR integration.

Direct Benefits

The case study determined that the pilot had numerous immediate benefits with respect to the issues that had been raised before the pilot.

REDUCED MANUAL COMMUNICATION – ASSET INGESTION

Inefficient transfer of data between stages of the pipeline was given as a significant problem. Here we examine the particular case of transferring the assets that have been ordered from Warner Bros. to Microsoft.

In the original system, assets had to be manually inspected, files opened, and so on to determine which asset was being delivered,

and then collated against the order sheet. This was addressed by providing EIDR IDs in the avails list, adding the EIDR ID to the name of the delivered file, and using EIDR for matching the mezzanine files. With that in place, Microsoft only had to match the EIDR ID in the file name to the EIDR ID in the avails list.

Warner Bros delivers approximately 5,400 files per year to Microsoft, each of which took 1-2 minutes for quality control on the matching. The new system effectively removes that effort, saving 270 hours/year or approximately .15 FTE.

REDUCED MANUAL COMMUNICATION – DELIVERY REPORTING

Another case of inefficient communication involved the asset delivery reports from Microsoft to Warner Bros. These reports state which of the assets that Microsoft has ordered

have been successfully delivered to the retailer.

In the original system, these reports were based on fuzzy matching between the delivered titles and the ordered titles. This was improved by matching the EIDR ID of the asset that was ordered to the EIDR ID of the asset that was delivered. This is an exact match, not a fuzzy string match that requires human confirmation.

There are about 100 ad hoc requests for delivery reports per year, which took on average five hours per request. Conservatively, this was estimated at 375 hours per year, or approximately 0.22 FTE.

Asset Identification Queries

The customer (Microsoft) would often have questions about asset identification and delivery, for example when a fuzzy matching algo-

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Don Dulchinos is responsible for growing and extending the use of EIDR as the top-level Universal Media ID for all movie and TV content. EIDR's mission is to drive out inefficiencies in the supply chain, while enabling new business models and workflow processes to support the increasing opportunities in digital distribution of content. EIDR is an independent non-profit entity with Founders including Cable Television Laboratories, Movie Labs, Comcast, and Rovi.



Raymond Drewry has been in the industry for 25 years primarily as a technologist. He has designed and implemented systems that range from the first fully interactive digital cable network in Europe, through the first-ever networked digital video system for journalists at an international sporting event, to real-time robotics systems for special effects and mechanical-industrial performance pieces.

Making the digital pipeline more efficient and less costly will encourage the creation of new and innovative businesses based on digital distribution.

rithm gave non-intuitive results or when an expected asset was not delivered.

In the original system, Warner Bros. had to spend time researching these queries based on the various identifiers in different parts of the pipeline. By using EIDR IDs in the avails, ordering process, and file names, the number of queries has been reduced and the queries that do occur are easier to resolve.

The benefits from this are mostly intangible – Microsoft does not disrupt its workflow to make the queries, and Warner Bros. does not have to answer as many customer requests, manage the accompanying logs, and so on. Microsoft had been making 50 or so queries a year, each one of which took 5-10 minutes to resolve. This equates to about seven hours per year per partner – not a lot in the grand scheme of things, but certainly reducing a source of frustration.

Future Benefits After Full System Integration of EIDR

The integration of EIDR into the workflow has already led to improvements in efficiency and quality, as described above. There are several other areas beyond the initial scope that can be tackled now that EIDR IDs are flowing through the system.

Manual Invoicing Processes

Currently, Warner Bros. must manually match internal invoice line items with retailer product identifiers. To do this, Warner Bros. exports invoice data to spreadsheets and manually links every title to the retailer's ID or IDs. This process determines the material servicing and delivery fees.

The solution to this is to more fully integrate EIDR IDs into Warner Bros.' order management system. This will reduce the need to extract line items from invoices, research retailers' product identifiers, and do manual title matching.

It currently takes two days to process large files and an additional day to complete the per-item research. It is estimated that automating this process can save a further 1,000 hours per year, or approximately 0.5 FTE, based on the reduction in the time taken to do title matching.

Manual Performance Reporting

Currently, sales performance reporting is based on raw data files from retailers and involves manual title matching, and translation of retailer IDs. The work is particularly complex when developing business intelligence that covers multiple versions of assets or the relationships of episodes, season and series.

EIDR maintains a hierarchy that connects related records, such as particular versions or digital encodings of a title. The solution is to use this hierarchy all the way through to point of sale and in point of sale and royalty reports. This will reduce error in the reports and make them simpler to generate.

Currently, there are 3-4 high complexity reports per month, taking one to two days each, and 16 low complexity reports per year, each taking 2-4 hours. This totals approximately 96 hours per year, or about two weeks. The main benefit, however, is expected to be from more accurate and timely reports leading to better business decisions. It has been shown in many industries and circumstances that the availability of timely, correct, and relevant reports tends to drive improvements in the underlying business.

Next Steps for Standardization of Digital Video Distribution

For both Warner Bros. and Microsoft, the savings described in this study are per partner, not one-time events. Both Warner Bros. and Microsoft expect future business partners to benefit from this initial effort as well. The effort and pain of integrating in a unique

way with each successive business partner is greatly reduced.

EIDR Momentum Continues to Build

This case study documents a first step in the quest for greater efficiencies, some of which have been described above. As this article was being submitted for publication, EIDR members Microsoft, Google, and Vudu were meeting with the Hollywood studios under the auspices of the DEG: The Digital Entertainment Group on a Cross-Studio Digital Distribution Model that will align around EIDR as one of many elements of a modern and efficient ecosystem for digital distribution that includes operational processes, transactions, data and systems.

Such efforts in the digital distribution world are also expected to generate benefits for other players in the media and entertainment world, including Technical Services Organizations, Cable Service Providers and Broadcasters and Ad-Supported Digital Streaming Channels. Making the pipeline more efficient and less costly will encourage the creation of new and innovative business based on digital distribution.

The EIDR ID as universal identifier was a long-awaited concept. It has not taken long for various interested parties to develop numerous use cases for the identifier, setting the stage for efficient, streamlined work flows to support the new world of entertainment everywhere, anytime, on any device. Additional content owners, service providers, and media services companies continue to join the EIDR organization every month. Membership information, tools and resources are available at www.eidr.org.

Thanks to Cognizant Research, which was contracted to EIDR to document this case study, and to our colleagues at Warner Bros. and Microsoft. ■