



Coalition for Innovative Media Measurement

TAXI success criteria and
suggested deployment phases

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Executive Summary

Executive Summary

The volume of content has dramatically increased. The combined increases in the amount of commercial video content and the explosion of distribution channels and delivery platforms has led to a multiplier effect on overall content volume. As a result:

- ▶ Content owners are facing incredible difficulty monetizing their assets, and simply figuring out where and when they have been played.
- ▶ Advertisers are facing an increasingly inefficient cross-platform supply chain where matching their messages with quality content and audiences is becoming more difficult.

Executive Summary

Asset identification and tracking have not kept pace. Key business applications, technologies and supporting operational processes have not scaled commensurate with the content explosion. Fundamentals of trade between entities are still operating on models developed decades ago.

- ▶ Content owners are typically able to monetize a very small portion of their overall libraries due to today's relatively high cost, but low relative return, associated with getting ad-supported long-tail assets in front of consumers.
- ▶ The lack of comparability of metrics across channels and platforms has led to confusion with advertisers and their agencies. It is difficult and time-consuming to evaluate ad performance across multiple platforms and channels. Real-time, in-flight campaign adjustments are, in effect, impossible, even though such a capability is highly desired by advertisers.
- ▶ Because it is costly and difficult to track content, licensing models have barely evolved despite the plethora of new content monetization opportunities and a commercial interest in doing so.
- ▶ The economic benefits of media workflow automation have not been realized because of the difficulty in passing asset-related information, including metadata, between systems that cannot cross-identify assets.
- ▶ Enormous, unnecessary cost is incurred across the content and advertising value chain because of duplicate, manual data entry and the constant necessity to map one asset identifier to another.
- ▶ The industry is clamoring for a simple, low-cost method for keeping track of content - both entertainment and advertising assets - and numerous schema have emerged, **but the industry has yet to coalesce around a common methodology.**

Executive Summary

The industry wants a way to track assets across platforms. The industry is ready. Executives with whom we spoke clearly articulated the need for *trackable asset cross-platform identification* ("TAXI"). We met with more than sixty executives from almost twenty entities across the content ecosystem, and were told over and over again that:

- ▶ **TAXI is desired.** The industry appears to have hit a tipping point and is ready for a consistent, open-standard approach to asset identification.
- ▶ **TAXI is technically feasible.** The combination of cloud computing and web services have made this realistic. It can be implemented and operated at a price-point that makes sense.
- ▶ **TAXI is operationally feasible.** Organizations have articulated a plethora of ways in which the TAXI concept would simplify content management and advertising operations, and reduce cycle time and associated costs.

The industry is ready for TAXI now. The dramatic increase in the volume of content, combined with the pace of innovation around distribution platforms, devices and channels, has created the industry catalyst for the adoption of TAXI.

Executive Summary

TAXI must address several practical requirements to be successful. There were several key attributes that industry constituents stated must be considered *if* the TAXI concept is to be adopted as a standard within our industry.

- ▶ **Simple:** TAXI must be easy to implement and operate. The less complex the better. Every entity with whom we spoke reinforced that each additional procedural, operational or technological change that has to be made will increase the barrier to a successful industry-wide TAXI adoption. Keeping it simple was the single most repeated critical success factor.
- ▶ **Interoperable:** Most participants in this study stated that if there was no prevalent asset identification methodology in use today, the TAXI vision would be most simply fulfilled with a single ID solution supported by domain-specific metadata. However, today's media landscape includes several prevalent asset ID systems, and as such, it is critical that TAXI be designed so that these currently incompatible systems become fully interoperable, at a layer transparent to the people, processes and technologies involved in managing assets, and transmitting and exchanging asset-related information.
- ▶ **Inextricably bound:** Technology standards must be created so that IDs can be permanently linked to their associated assets without degrading quality.
- ▶ **Extensible:** TAXI must be capable of identifying multiple content types, versions and formats, and should be designed flexibly to accommodate emerging and future media asset types.
- ▶ **Open and global:** TAXI must be an open standard. It must be governed by registries accessible to all ecosystem participants and suppliers on a world-wide basis, and adhere to standards that M&E industry companies, including technology suppliers, can utilize across a global footprint.
- ▶ **Cost effective:** TAXI must be value driven - a low cost-barrier to adopt and operate, both in terms of direct costs (one-time implementation costs and ongoing fees paid to the TAXI registry or registries) and indirect costs (operational costs, including labor) to utilize TAXI as the volume of assets and their derivatives continues to climb.

Executive Summary

The TAXI implementation is going to be an enormous industry undertaking. There were significant levels of interest exhibited during this study with an equal appreciation for the full complexity of the task ahead. For TAXI to work, a critical mass of industry participants all need to move forward at the same time in the same way. The industry will thus need a catalyst - a few committed major media companies who implement TAXI and demonstrate its value - to spark widespread concurrent adoption.

- ▶ **Start by proving TAXI's value to the C-Suite.** The single most important stimulus for TAXI's success will be demonstrating clear, quantifiable economic benefits that can be achieved in realistic timeframes at reasonable costs. Executives with whom we met stated that a well-publicized and successful "proof of concept" should be undertaken to demonstrate economic upside to CFOs within technical and operational investment parameters deemed feasible to CTOs. We have to prove that this is worth doing, and worth doing now.
- ▶ **Take steps to attract critical mass before stepping too far.** Because certain economic benefits will be achievable only when multiple parties across a given media sector supply-chain adopt TAXI, a phased implementation approach may be the best way to drive tangible business benefits that continuously outweigh implementation costs and "disruption" factors. A stepped approach will improve the likelihood of industry-wide adoption.
- ▶ **Don't forget to keep it simple.** TAXI must be designed so that there are as few technical and operational barriers as possible. Make TAXI a "no brainer" and the industry will come.

Executive Summary

Practical Next Steps

TAXI is feasible... now take it to market!

We spoke with more than sixty executives from almost twenty M&E ecosystem companies who each possess a level of business, technical and/or operational depth in asset identification. It was relatively easy to get this group on board. It will be far more difficult to do so with their chiefs... those that will ultimately have to demand TAXI be deployed into the market. For the C-Suite, this must be a burning economic platform - one that has clear revenue growth and cost savings benefits.

We suggest CIMM consider the following steps to make influencing this C-level group easier, and to take TAXI from concept to execution:

1. **Convene a cross-industry working group** to develop technical specifications and agree to an asset identification and metadata schema for one or more pilots, along with an ID-to-asset binding technology. Develop data exchange and transmission standards for each use-case designed to be tested within the pilot(s). The identifier and associated technology and data exchange standards may be re-designed or enhanced pending the outcome of each pilot.
2. **Design each pilot program to prove TAXI can deliver.** Validate anticipated outcomes with participating C-suite executives, and gain commitment that if relevant results are demonstrated, that they will champion the TAXI vision to industry peers.
3. **Recruit entities** across the content production, distribution and advertising value chains to participate in one or more pilots with the goal of proving a combination of revenue opportunities and tangible reductions in overhead costs. Cite tangible, quantifiable benefits that are achievable with TAXI.
4. **Highly publicize the results** through the publication of a “white paper” and/or presentation in a widely-attended press event or conference.
5. **Initiate a phased approach** to implementing the TAXI concept so that ecosystem players’ benefits continually outweigh the amount of disruption incurred. **And keep it simple.**

Detailed Findings

The time has come for asset identification

Growth in our industry's complexity has created the business case

The volume of content has dramatically increased. The combined increase in the amount of commercial video content and the explosion of distribution channels and delivery platforms has led to a multiplier effect on overall content volume.

A decade ago, a TV program had two potential revenue streams: network broadcast and syndication. Now, a TV program has 12 to 14 different sources of revenue including VOD, online streaming (rental and purchase), physical DVD (rental and purchase), mobile streaming, an iPad application, etc.

Source: "Moonves: Reverse Comp to Grow in 2011 And Beyond," Broadcasting & Cable, 22 September 2010, via Dow Jones Factiva, © 2010, Broadcasting & Cable, Reed Business Information, a division of Reed Elsevier, Inc.

There were 37 cable programming networks launched during the first 20 years of cable. Sixteen years ago, there were 139 national cable programming networks. Now, there are over 530.

Source: "Bewkes Reshapes Time Warner; Cable Spinoff Marks CEO's Latest Maneuver," Multichannel News, 26 May 2008, via Dow Jones Factiva, © 2008, Multichannel News, Reed Business Information, a division of Reed Elsevier, Inc.; "History of Cable Television," National Cable Telecommunications Association website, <http://www.ncta.com/About/About/HistoryofCableTelevision.aspx>,

Within the US, the percentage of households with VOD functionality has increased from 3.8% in 2001 to over 46% in 2010. Spending on VOD has increased from \$68m in 2001 to over \$2B in 2010.

Source: Veronis Suhler Stevenson, "Communications Industry Forecast," 2007 and 2010.

Asset identification and tracking have not kept pace. Key business applications, technologies and supporting operational processes have not scaled commensurate with the content explosion. Fundamentals of trade between entities are still operating on models developed decades ago.

Existing asset identification solutions

Cross-platform asset identification has not yet been standardized

To gain an appreciation of the “current state” of asset identification, we spoke with a several well-known commercial entities, each with proprietary asset identification solutions. These entities deploy their asset identification solutions for the purpose of providing syndicated audience measurement and research services, or for managing digital assets within their media platforms. Entities generally assign proprietary asset IDs and associate internally-managed metadata to facilitate the execution of their services.

These entities use active content watermarking, passive fingerprinting, and/or tagging to transmit asset information. Entities use active content watermarking to embed the identifier “within” the assets, passive fingerprinting to be able to “find” the assets and then discern their identities, and/or tagging to transmit information about assets between content servers and their proprietary logging databases.

During our initial investigation of the current state, we met with four categories of entities that use one form or another of asset identification:

1. Entities able to identify assets across platforms using watermarks and/or fingerprints, cross-referenced to their databases
 - ▶ Arbitron
 - ▶ Kantar
 - ▶ Nielsen
2. Entities able to identify assets using file names cross-referenced to their asset databases
 - ▶ comScore
 - ▶ Quantcast
 - ▶ Rentrak
3. Registries for assets and domain-specific metadata
 - ▶ Ad-ID
 - ▶ EIDR
4. Video distribution platforms that have developed proprietary content asset management and identification systems
 - ▶ Freewheel
 - ▶ Hulu
 - ▶ YouTube

Existing asset identification solutions

A sample of asset ID usage at a glance

Entity	Primary Identification Method			Significant Platform(s)			Business Service		
	Watermark	Fingerprint	Other	TV	Broadband	Mobile	Registry	Content Distributor	Media Research
Arbitron	✓			✓					✓
Kantar	✓	✓		✓	✓				✓
Nielsen	✓	✓		✓	✓	✓			✓
comScore			✓		✓	✓			✓
Quantcast			✓	✓	✓				✓
Rentrak			✓	✓	✓	✓			✓
Ad-ID			✓	✓	✓		✓		
EIDR			✓	✓			✓		
Freewheel			✓		✓			✓	
Hulu			✓		✓			✓	
YouTube		✓			✓	✓		✓	

See Appendix A for summary-level information about each of these entities.

Detailed entity descriptions, key-terms definitions and other explanatory notes can be found within Ernst & Young's Asset ID Primer.

Existing asset identification solutions

Summary of well-known ID registries and schemas



- ▶ **Founded by:** The ISAN (International Standard Audiovisual Number) Registration Authority
- ▶ **Asset types covered:** Audio-visual assets (feature films, serials, documentaries, live broadcasts, video games, etc.).
- ▶ **Construct:** 24 hex digits (96 bits) to convey asset related metadata.
- ▶ **ISAN adoption:** 18 appointed registration authorities, 550,000 allocated ISAN's with 59% of the whole database representing works produced in North America.
- ▶ **Adoption Impediments:** Cost and difficulty in registering asset versions, derivatives or related works. Rules on the type of assets permitted within the registry (narrow scope).



- ▶ **Founded by:** MovieLabs, CableLabs, Comcast, Rovi and others
- ▶ **Asset types covered:** Audio-visual assets, which can be both physical and digital video objects, that are part of the movie and television supply chain.
- ▶ **Construct:** The DOI-based opaque ID is designed to be unique for each registered asset.
- ▶ **EIDR adoption:** Launched 10/2010; received positive response and strong partnership commitment from major studios. Pre-populated with ~200,000 top-level records to facilitate easy adoption.
- ▶ **Adoption Impediments:** EIDR launched with a focus on feature film and television production assets, but not advertising.



- ▶ **Founded by:** The 4A's and the ANA
- ▶ **Asset types covered:** Advertising assets.
- ▶ **Construct:** First four characters are alphabetic to represent advertiser, and next four are numeric to represent spot.
- ▶ **ISCI adoption:** ISCI is a manual advertising asset-coding system that has been used by advertisers since 1969 but was formally withdrawn and replaced by Ad-ID in 2007. Despite this, many advertisers, agencies and media companies continue to use ISCI.
- ▶ **Adoption Impediments:** ISCI's are not globally unique and can result in collision if two assets are assigned identical ISCI's. The lack of a registry limits cross-sector utility.



- ▶ **Founded by:** The 4A's and the ANA
- ▶ **Asset types covered:** Advertising assets (print, video, digital, voice).
- ▶ **Construct:** Specified characters to represent advertiser prefix plus additional characters to represent each unique advertising asset. An additional suffix-digit is used to designate assets in SD or HD quality.
- ▶ **Ad-ID adoption:** Approximately 21% (590) of parent companies that spend >\$5 million annually on advertising (2,855) are actively using Ad-ID.
- ▶ **Adoption Impediments:** Perceived high cost to smaller advertisers, and difficulty in maintaining ID-to-asset integrity as ads flow across distribution channels and platforms.

The industry is ready now

Significant “takeaways” supporting the move to TAXI

Overwhelmingly, we were told that the TAXI concept would substantially improve many aspects of the media and entertainment industry supply-chain that have grown unwieldy with the proliferation of content distribution channels and platforms.

- ▶ There are dozens of proprietary and incompatible asset identification systems deployed across the M&E ecosystem. As a result, there is tremendous inefficiency and complexity associated with tracking commercial assets across multiple platforms.
- ▶ TAXI would enable the sharing of asset-related tracking information between entities and across platforms, reducing asset management costs and complexity. TAXI would improve transparency, thereby establishing a catalyst for more dynamic and flexible content marketplaces.

“I can’t tell you how great it would be for our business if this existed today. We would easily take own our data acquisition and normalization costs by 30%, which we could invest in better analytics. The way we present data will massively improve.”

“If the industry - the entire M&E ecosystem - decided to coalesce around a content identifier method that included a unique ID for each programming and advertising asset, including constructs about related assets; would this be valuable? Absolutely.”

“This is a small industry. If just a few influential players support it (TAXI), then it will happen.”

“On a macro level, if this is something that is solved, it will help drive more TV money into online video.”

“The future of media is in the connection of measurement and delivery. If all [content and advertising] assets were uniquely identified, it would make measurement services more useful for comparison.”

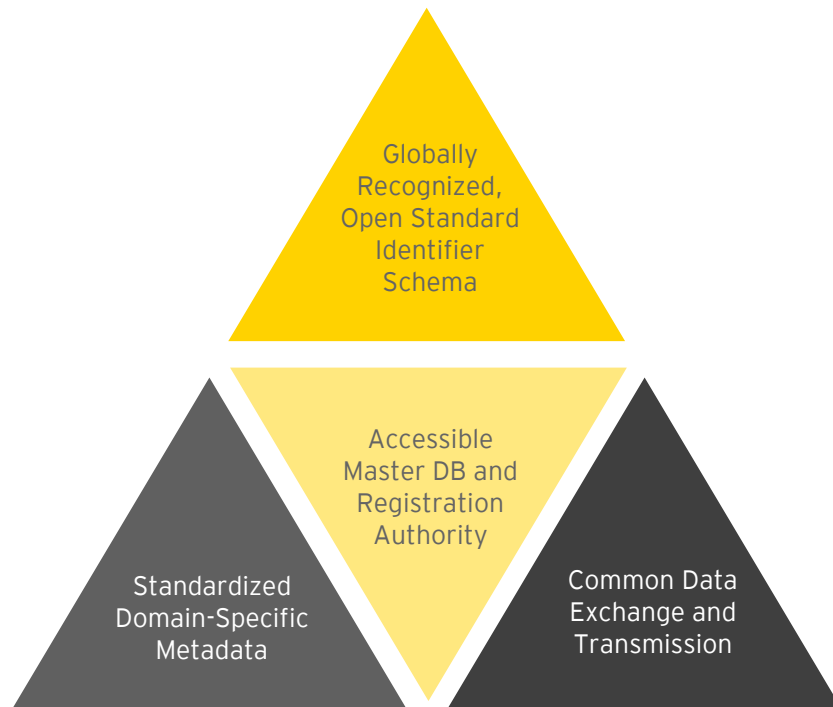
The industry is ready now

Significant “takeaways” supporting the move to TAXI

We reviewed the veritable cornucopia of disparate asset identification methodologies with more than sixty executives from almost twenty M&E ecosystem companies. For many, the current ID maze was overwhelming. But once understood, their feedback was consistent and very clear: **cross-platform asset identification is necessary, and must be simplified for TAXI to move from an academic concept to industry adoption and execution.**

- ▶ **A single ID system is the simplest solution.** Sentiment among those with whom we spoke was that if none of these commercial solutions and public registries existed today, it would be possible for the industry to design a robust identification system consisting of a single ID schema and registry for all digital media and entertainment assets. Each ID would be associated with a minimal set of relevant asset-specific metadata unique to each asset type (e.g., advertisement, episodic programming, feature film). With this single ID system, M&E supply chain companies could adapt their in-house systems in a uniform fashion to recognize these IDs, and develop standardized protocols upon which information would be captured and exchanged to facilitate supply-chain efficiency and value to participating entities.
- ▶ **However, in today’s multi-ID supply chain, retrofitting to just one may not be practical.** As Voltaire wrote in his *Dictionnaire Philosophique* (1764), “The perfect is the enemy of the good.” That sentiment may very well be true today. Our industry has adopted a plethora of asset identification methodologies - many proprietary and some open, but all currently incompatible. Many thousands of hours and millions of dollars have gone into developing technologies that can create, read and act upon incompatible identifiers. While it may be desirable, it may be impractical to dismantle this web of asset ID methodologies in favor of just one.
- ▶ **The next-simplest (and more practical) solution is interoperability.** Given current-state realities, we recommend that those tasked with figuring out how to deploy the TAXI concept in the marketplace consider how to use a type of “wrapper” or “halo” technology to make the most commonly used ID systems compatible. We suggest the industry develop a technology-enabled standard that will permit disparate systems to talk with each other, exchange data and co-exist in a fully compatible fashion. This technology standard should make this interoperability fully transparent to existing supply-chain applications (e.g., the incumbent content production and distribution systems) and of no import to business operations. There are several such wrappers in existence today. While none currently solves this issue fully, many could likely be extended to do so with the right cross-industry support.

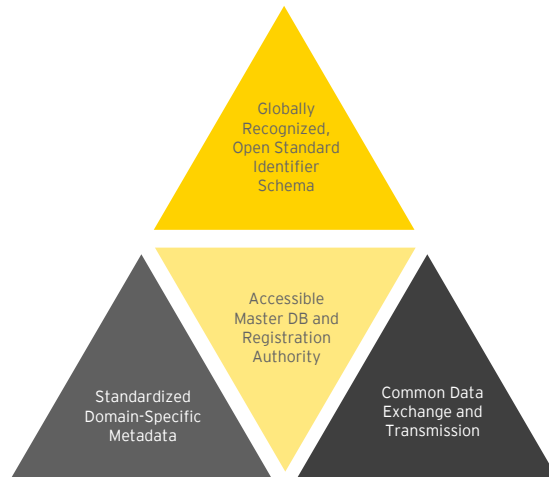
TAXI attributes



The next several pages outline the attributes participants in this feasibility study recommended be included in the TAXI design specification. These are the attributes that industry constituents said, “if you build this, we will come.”

- ▶ **There are four thematic attributes under which we have listed more specific success-criteria.** The details included within this report are those that we heard many times from many individuals across many business functions.
- ▶ **We recommend the industry implement the TAXI concept in phases.** We have laid out a vision for what could occur in each of these phases, and recommend that those driving the implementation establish a critical mass of industry participants within each of the phases before moving to the next.

TAXI attributes



Standardized Domain-Specific Metadata

- ▶ Standard metadata taxonomy for each asset domain (e.g., film, episodic content, advertising)
- ▶ Minimal public metadata (only those fields necessary for all parties to transact)
- ▶ Interoperable with robust private metadata, including reference to house IDs
- ▶ ID assignment occurs early in the lifecycle; metadata populated as appropriate during asset development and deployment

Globally-Recognized, Open Standard Identifier Schema

- ▶ Open, global standard ID schema
- ▶ Consistent ID format (i.e., ID length, alphanumeric construct)
- ▶ Scalable across a variety of asset types, versions, editions, variants and derivatives
- ▶ Flexible and extensible to accommodate asset types not yet conceived
- ▶ Compatible for use with multiple players and platforms
- ▶ Easy and inexpensive to generate, maintain and utilize

Accessible Master Database and Registration Authority

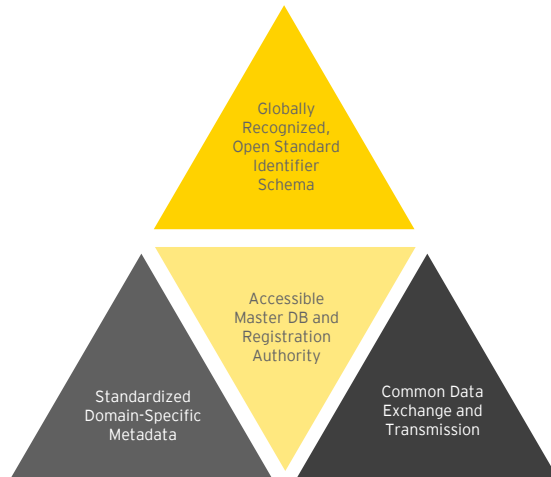
- ▶ Ecosystem-wide, globally accessible registration authority
- ▶ Supports ID generation and assignment via web APIs
- ▶ Machine readable and searchable via web APIs
- ▶ Human-language searchable through common web interfaces
- ▶ Asset edit rights and control authentication
- ▶ Security / access controls over metadata
- ▶ Robust de-duplication capabilities (e.g., via fingerprint, watermark, metadata)

Common Data Exchange and Transmission Standards

- ▶ Open standard technologies / APIs for entities to exchange data with the registry, internally between systems, and with each other
- ▶ Open standard technologies to inextricably bind ID and asset
- ▶ Metadata populated through existing asset management infrastructure, and accessed through existing ecosystem technologies
- ▶ Uniform asset ID data transmission methodologies to facilitate information exchange and workflow automation between ecosystem players and/or the registry

TAXI attributes

Benefits must outweigh operational disruption and costs



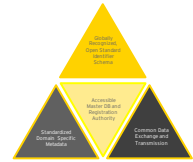
With significant industry adoption, TAXI must enable a variety of tangible business applications across the ecosystem, such as:

- ▶ Increased accuracy in asset identification across distribution channels and platforms
- ▶ Improved, more accurate media measurement and analytics with a commensurate reduction in data acquisition and normalization complexity
- ▶ Reduced complexity in buying, selling and delivering media, and in media billing and clearance
- ▶ Reduced complexity and cost in managing rights, royalties and licenses
- ▶ Improved transparency and clarity on asset production costs
- ▶ Simplified and more automated workflows across the content and advertising value chain

Simplicity is key. Operational disruption and associated implementation costs must make it incredibly easy and highly desirable for industry ecosystem participants to adopt TAXI.

- ▶ Low cost and insignificant effort to register assets, populate metadata and obtain IDs
- ▶ Compatibility and interoperable with existing asset ID schemas, including both other “public” IDs and private (house) IDs
- ▶ Minimal up-front technology investment
- ▶ Operational disruption is near zero until a significant-enough portion of the industry has adopted TAXI
- ▶ Only after quantifiable, tangible business benefits are derived can adoption costs and disruption increase commensurate with incremental ongoing benefits

Phase 1 TAXI attributes



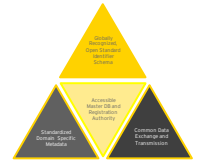
Scope

1. Adopt an ecosystem-wide identification standard
2. Select one or more interoperable registration authorities
3. Agree to standardized public, domain-specific metadata
4. Establish a working group to develop binding technology standards

Attributes

Globally-Recognized, Open Standard Identifier Schema	Accessible Master Database and Registration Authority	Standardized Domain-Specific Metadata	Data Exchange and Transmission Standards
<ul style="list-style-type: none"> ▶ Open standard, globally recognized, deployed in selected geographies ▶ Consistent ID format (i.e., ID length, alphanumeric construct) ▶ Scalable across a variety of asset types, versions, editions, variants and derivatives ▶ Compatible for use with multiple players and platforms ▶ Flexible and extensible to accommodate asset types not yet conceived ▶ Easy and inexpensive to generate, maintain and utilize 	<ul style="list-style-type: none"> ▶ Iterative registry deployment; incremental asset domain coverage ▶ Ecosystem-wide accessibility ▶ Capable of cross-referencing other public registries ▶ Supports ID generation and assignment via web APIs ▶ Machine readable and searchable via web APIs ▶ Human-language searchable through common web interfaces ▶ Asset edit rights and control authentication ▶ Security / access controls over metadata ▶ De-duplication capabilities based on metadata 	<ul style="list-style-type: none"> ▶ Standard taxonomy for each asset domain (e.g., film, episodic content, advertising) ▶ Minimal public metadata (only those fields necessary for all parties to transact) ▶ Interoperability with robust private metadata including reference to house and other IDs ▶ ID assignment occurs early in the lifecycle; metadata populated as appropriate during asset development and deployment ▶ Common method for relating content-equivalent assets (e.g., SD and HD versions of the same asset) and asset versions or derivatives 	<ul style="list-style-type: none"> ▶ Use case-specific metadata groupings and business rules ▶ Open standard technologies / APIs for users to exchange data with the registry ▶ Metadata populated through existing asset management infrastructure and accessed through existing ecosystem technologies ▶ Standards setting process in place for establishing ID-to-asset binding technology

Phase 1 TAXI benefits and limitations



Scope

1. Adopt an ecosystem-wide identification standard
2. Select one or more interoperable registration authorities
3. Agree to standardized public, domain-specific metadata
4. Establish a working group to develop binding technology standards

Business Application Examples

- ▶ Simplified aggregation of de-duplicated asset-related play data across platforms
- ▶ Established single point-of-reference for any measurement service across a content owner's asset catalog
- ▶ Reduced complexity and cycle time in clearing media discrepancies, thereby reducing liabilities
- ▶ Provision for greater production accounting transparency; more informed studio green-lighting processes
- ▶ Complimentary and potentially accelerated deployment and adoption of several asset-related cross-industry initiatives (e.g., UltraViolet, KeyChest)
- ▶ Improved internal rights and licensing management processes through the enablement of more comparable cross-platform analytics
- ▶ Stronger governance when one or more industry-selected registration authorities oversee issuance of all IDs

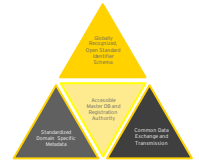
Benefits of the Phase 1 Deployment Approach

- ▶ Simplification with minimal disruption
- ▶ Minimal up-front technology investment (reduces barriers to adoption)
- ▶ Minimal disruption to ecosystem operations
- ▶ Catalyst for standardizing certain asset-related workflows

Limitations of the Phase 1 Deployment Approach

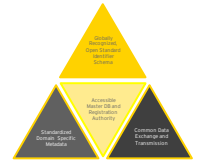
- ▶ Limited automation in this phase may require some increase in manual work-steps, which may limit adoption
- ▶ Increased operational overhead to maintain ID-to-asset linkage until such technology standards have been implemented (planned for Phase 2)
- ▶ While the registry is working through asset ownership and edit-rights assignments, multiple IDs could be assigned to a single asset, impacting accuracy of reporting

Phase 2 TAXI attributes



Scope	<ol style="list-style-type: none"> 1. Implement technology to inextricably bind ID and asset 2. Expand geographic deployment 3. Develop data exchange standards 			
Attributes	Globally-Recognized, Open Standard Identifier Schema	Accessible Master Database and Registration Authority	Standardized Domain-Specific Metadata	Data Exchange and Transmission Standards
	<ul style="list-style-type: none"> ▶ Broadly deployed across multiple geographic regions 	<ul style="list-style-type: none"> ▶ Robust de-duplication capabilities based on metadata and asset signature (i.e., fingerprint, watermark or other technology-based asset identification solution) 	<ul style="list-style-type: none"> ▶ Digital signature (i.e., fingerprint or watermark) represented in metadata 	<ul style="list-style-type: none"> ▶ Agreement on open standard technologies to inextricably bind ID and asset (i.e., fingerprint or watermark) ▶ Selection of appropriate vendor(s) to develop binding technologies ▶ Integration of binding technology infrastructure across the production and distribution supply chain

Phase 2 TAXI benefits and limitations



- Scope**
1. Implement technology to inextricably bind ID and asset
 2. Expand geographic deployment
 3. Develop data exchange standards

Business Application Examples

- ▶ Reduced complexity and cost in managing rights, royalties and licenses
- ▶ Simplified and standard means by which content distributors facilitate discoverability
- ▶ Minimized advertising order-to-play discrepancies

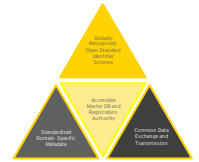
Benefits of the Phase 2 Deployment Approach

- ▶ Next level of enablement for business benefits across the ecosystem
- ▶ Enhanced accuracy in asset identification
- ▶ Higher value-added services enabled from measurement and analytics companies due to quantifiable cost reduction associated with collecting, aggregating and normalizing asset-related play data

Limitations of the Phase 2 Deployment Approach

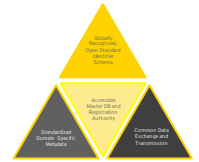
- ▶ Increased technical complexity and investment
- ▶ Potential time delays due to integration with incumbent production and distribution systems
- ▶ Possible disruption to existing transmission processes as entities begin to leverage the benefits of ID-to-asset binding capabilities
- ▶ Potential competitive reaction from existing incumbent solution providers

Phase 3 TAXI attributes



Scope	1. Implement standards to exchange information through automated workflows			
	Globally-Recognized, Open Standard Identifier Schema	Accessible Master Database and Registration Authority	Standardized Domain-Specific Metadata	Data Exchange and Transmission Standards
Attributes	<ul style="list-style-type: none"> ▶ Continued global adoption for current and library content 	<ul style="list-style-type: none"> ▶ Potential addition of cloud-based data management and routing capabilities, operated by or in conjunction with the registry 	<ul style="list-style-type: none"> ▶ Continued extension of the registry to accommodate additional asset types 	<ul style="list-style-type: none"> ▶ Uniform data transmission and exchange standards, aligned with defined use-cases ▶ Standardized business rules that define how systems handle certain transactions

Phase 3 TAXI benefits and limitations



Scope 1. Implement standards to exchange information through automated workflows

Business Application Examples

- ▶ In general, fully-automated, system-controlled workflows for multiple, currently labor-intensive but lower-complexity tasks
- ▶ Facilitated information exchange and workflow automation between ecosystem players and/or the registry for more complex tasks requiring some part human intervention
- ▶ Capability for content owners to economically monetize current and long-tail assets through new distribution channels (e.g., content exchanges)
- ▶ Ability for content owners and distributor to experiment with evolving licensing models and test their economic implications quickly, and with full transparency
- ▶ Reduced complexity and cost in managing rights, royalties and licenses
- ▶ Improved transparency and clarity on asset production costs
- ▶ Simplified and standardized methods for targeting advertising within content or to identified devices at a granular level (and in a privacy-friendly fashion)
- ▶ Reduced overhead cost in buying, selling and delivering media, and in media billing and clearance
- ▶ Facilitated ability to analyze cross-platform campaign performance and make real-time, in-flight campaign adjustments

Benefits of the Phase 3 Deployment Approach

- ▶ Demonstrated business benefits, including automated workflows, will encourage widespread industry adoption

Limitations of the Phase 3 Deployment Approach

- ▶ Technology investments and changes to operational processes will be more expensive and disruptive in this phase than in any other phase

TAXI benefits must outweigh disruption

Overcoming inertia ... creating momentum

- ▶ **Critical mass is critical.** For TAXI to work, a critical mass of industry participants all need to move forward at the same time in the same way. Thus, the first few entities that commit to adopt and implement TAXI will see very little benefit until others join in.

Over and over again, participants in this study said that **operational and technology hurdles will be real but completely manageable**. The challenge, instead, will be **capturing the political will of some influential executives to make this happen**, and then sticking with it so that the full set of benefits (phase 3) are actually achieved.

"No one wants to be first... everyone wants to be 10th to join."

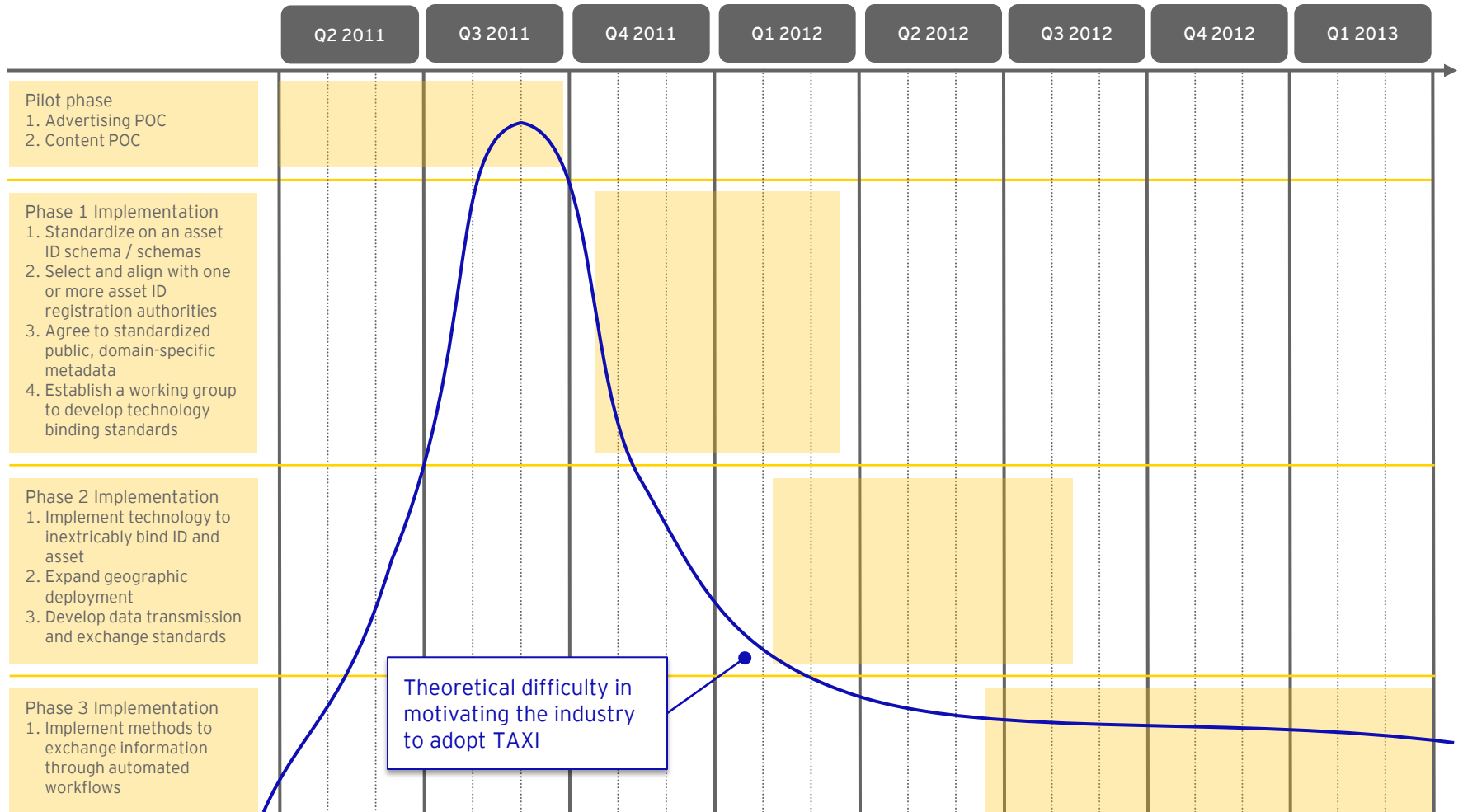
"If someone like Ultraviolet would set the tone, we'd all use one identifier."

"This is a small industry. If just a few players with influence will support TAXI, then it will happen."

- ▶ **To overcome inertia, TAXI has to be proven.** Executives with whom we met suggested that a well-publicized and successful "proof of concept" in which a small number of large media companies and service providers participate may be the catalyst that motivates the ecosystem to move forward in concert. We have to prove that this is worth doing, and worth doing now.
- ▶ **To create momentum, TAXI has to be implemented in manageable but deliberate forward-moving steps.** A phased implementation approach, where implementation costs and "disruption factors" are constantly outweighed by tangible business benefits will improve the likelihood of industry-wide adoption.

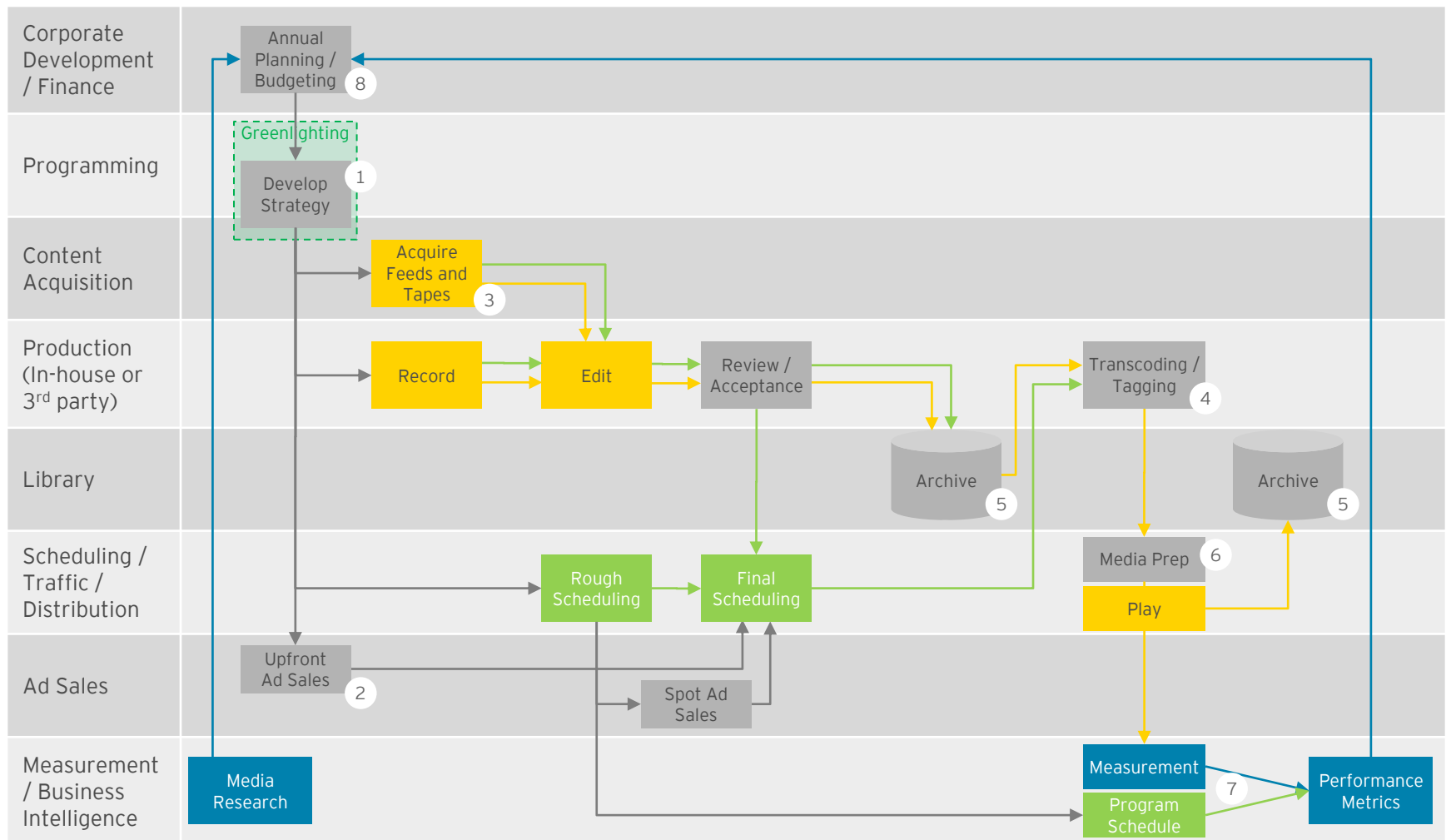
TAXI benefits must outweigh disruption

A phased approach to TAXI development and deployment



Operationalizing TAXI

Content production and distribution



Operationalizing TAXI

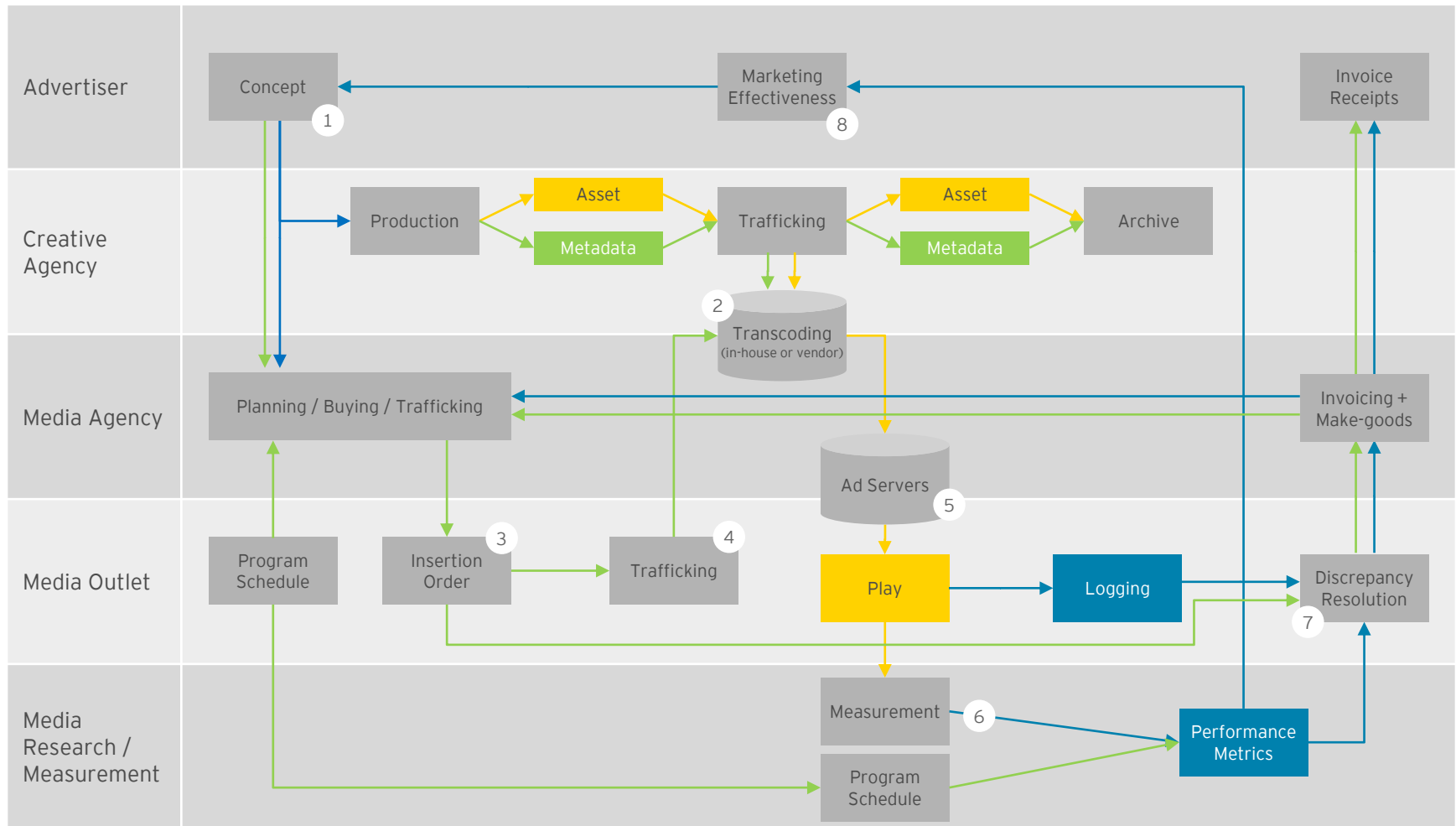
Content production and distribution

With the implementation of TAXI - standardized throughout the content development, production and cross-platform distribution supply-chain - we anticipate the following benefits can be realized. Line numbers refer to diagram on preceding page. Some improvements, but not all, will be feasible to test in a pilot (noted with the "(P)" indicator).

Ref. #	Current State	TAXI Impacts
1 (P)	Assets may be in production while programming is planning and trafficking using distinct, separate identifiers for the same asset.	Using a common identifier at the production stage will allow dailies to carry a common asset ID. This will help collect and search for assets.
2	Content owners do not have visibility into cross-platform and long-tail monetization of their assets.	More accurate media measurement would allow media distribution to accurately price its upfront buys.
3 (P)	Assets often arrive from satellite feeds and external sources without metadata and someone must re-key in the information.	Field tapes or digital recordings from digital cameras carrying an ID entered into the camera could carry the ID through ingest, associating them with a project which would enable production to automatically assemble components from ingest / satellite feed.
4	Production must send an asset and its metadata in two separate files, requiring manual input and creating potential for errors.	An archiving or transcoding department / vendor could look up metadata and "instructions" in central registry.
5	Archived content that has been improperly filed may not be monetizable if it can not be identified.	IDs could be queried using standard metadata within the registry to locate desired archive content.
6 (P)	Similar content distributed worldwide in various formats (e.g., languages, dubbing audio, captions) must be mapped using program title text.	Using a common ID would allow film/episodic acquisitions to be tracked from acquisition to distribution. Similar content distributed worldwide could be correlated by ID.
7 (P)	TV audience measurement companies must map program schedules to audience data to report performance of individual assets.	Measurement companies could report asset metrics without mapping to program schedules.
8 (P)	Content owners do not have an easy way to map metrics for assets across various channels and platforms.	Content owners could map metrics and analyze performance across channels and platforms .

Operationalizing TAXI

Advertising sales, operations and finance



Key: Asset Metadata Audience / Play Data

See next slide for references to TAXI influence on workflow

Operationalizing TAXI

Advertising sales, operations and finance

With the implementation of TAXI - standardized throughout the advertising supply-chain across distribution platforms and channels - we anticipate the following benefits can be realized. Line numbers refer to diagram on preceding page. Some improvements, but not all, will be feasible to test in a pilot (noted with the "(P)" indicator).

Ref. #	Current State	TAXI Impacts
1 (P)	Assets may be in production at the same time the media agency is planning and trafficking with each agency using distinct, separate identifiers .	IDs could be assigned to an asset at concept so that media and creative can communicate about the asset with a common identifier.
2 (P)	Agencies must send the asset and its metadata in two separate files, requiring manual input and creating potential for errors.	Transcoding vendor could look up metadata and "instructions" in central registry.
3 (P)	Media agencies may assign house IDs to enable billing and they must manually key in metadata.	Media outlets should not need to re-key metadata or assign house ids to assets.
4 (P)	Media outlets must key in data from insertion orders causing potential for error.	Media outlet could be sure they are pulling the right assets according to insertion orders.
5	Ad servers must rely on metadata accompanying assets to determine proper placement of ads.	Ad servers could access central registry for metadata to assign ads to appropriate content.
6	TV audience measurement companies must map program schedules to audience data to report performance of individual assets.	Measurement companies could report asset metrics without mapping to program schedules.
7 (P)	Discrepancy resolution is a time consuming and manual process.	Discrepancy resolution could be automated with reports from measurement companies using the same identifiers as trafficking schedules.
8	Advertisers do not have an easy way to map metrics for assets across campaigns.	Advertisers could map metrics and analyze campaigns across platforms

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