Asset management

Broadcasters are grappling with establishing more channels destined for more devices in order to preserve their competitive position. This puts a premium on efficient and economic Digital Asset Management. Colin Mann finds out how specialist developers and vendors are meeting broadcasters' needs.

Raoul Cospen, director of marketing, Dalet Digital Media Systems, suggests that without question, an end-to-end Media Asset Management solution makes it much easier to streamline workflows and manage content for use on additional channels and many different platforms. "These new distribution platforms allow customers to expand their reach and reinforce their brands while offering new revenue opportunities. This is why Dalet has put our MAM platform at the core of all our workflow solutions in news, sports, programme prep or radio. The MAM manages media, metadata, essences and workflows throughout the digital production chain, keeping track of all the essential information."

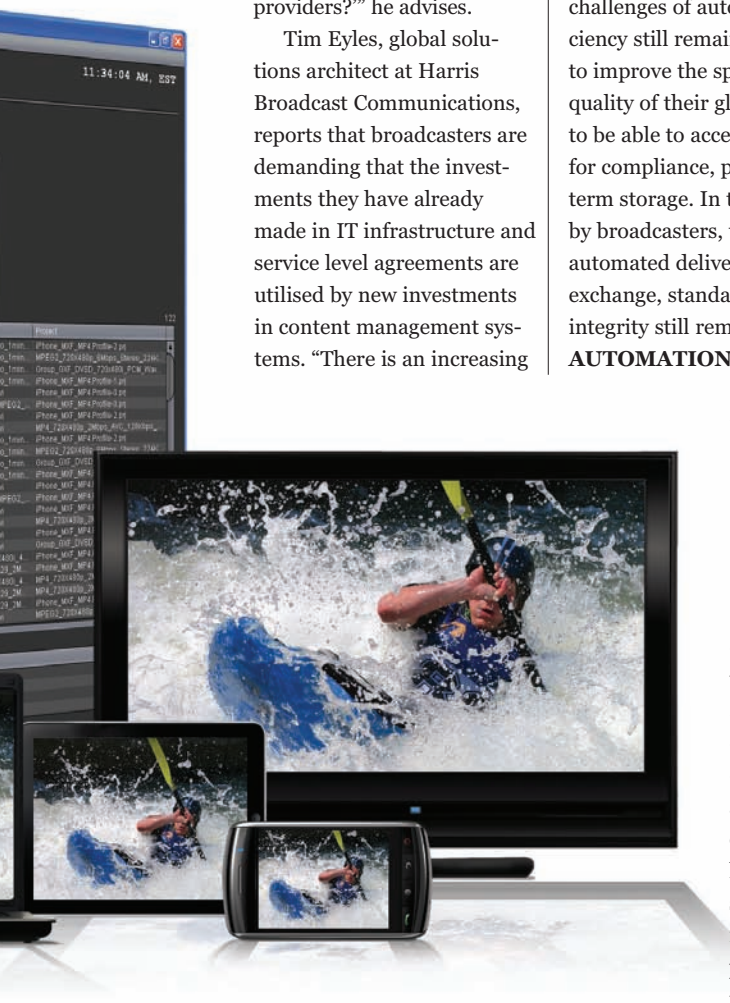
He points out that in addition, the MAM has a powerful workflow engine that automates many human tasks and processes resulting in greater efficiency and productivity. "For simple republication of content, the 'create once, broadcast many' optimisation model can be applied. All the specific requirements for multiformat distribution (format, metadata, branding, *etcetera*.) can be automated and handled in the background," he advises.

According to Richard Heitmann, VP of marketing at Aspera, a key demand for broadcasters is the need quickly and effectively to ingest content before they load it into a DAM system and subsequently edit, transcode and broadcast it across multiple distribution platforms. "Although DAM systems are advanced, ingesting big data can create bottlenecks and pose a real stumbling block to meeting tight deadlines," he warns. Aspera, as a developer, has sought to directly address this key demand and remove this major obstacle."

"Regardless of the storage technology deployed, MAM systems typically utilise a combination of security matrix, group policy and rights management tools to cope with multiple channels and clients."
BRAD REDWOOD, MASSTECH

NIGHTMARE. According to Peter Elvidge, deputy sales director at GlobeCast UK, even smaller broadcasters and content publishers would agree that the exploding number of devices and related technical formats and flavours creates a nightmare in terms of material preparation and delivery. "For all but the smallest players, manually manipulating content and metadata is simply impossible. It's equally impossible today to go to a single hardware or software provider for a technical solution that will provide all the formats and flavours necessary and work with existing metadata and rights management," he suggests.

"This leads to significant bespoke integration. The key challenge to solutions providers is finding the common approaches and promoting some 'best practice' to improve content workflows and drive costs and complexity down for our industry as a whole – this is a big challenge. Today almost all broadcasters have their own way of doing things, their own ideas and approach as to how their master material is stored, and vastly different metadata concepts. As an industry, we have to think 'Can we each afford to invent our own unique content delivery infrastructure?' or 'Can we



leverage industry service providers?'" he advises.

Tim Eyles, global solutions architect at Harris Broadcast Communications, reports that broadcasters are demanding that the investments they have already made in IT infrastructure and service level agreements are utilised by new investments in content management systems. "There is an increasing demand that traditional vendors fit the IT model in standardised platform support and integrated functional blocks, based around open database architecture."

FUNCTIONALITY. He suggests that broadcasters want to see tools and applications that allow them to repurpose and drive the value of their content to new platforms and distribution outlets, and that allowing for dynamic relational development of content usage and deployment in multiple formats to maximise the revenue possibilities for assets is key to exposing content to Over the Top, Video on Demand non-linear as well as baseband and IPTV linear delivery. "Broadcasters no longer wish to allow proprietary architecture and interfacing to dictate functionality," he notes.

Paul Worman, Eyles' global solutions architect colleague at Harris, adds that traditionally, broadcasters were able to plan well in advance where they were going and the infrastructure that was needed to fulfil this. "Today, the view forward is less clear and much more fluid, with changes occurring far faster than ever before; this can impact the broadcaster in many ways. Vendors can help with this by providing tools that are flexible and can easily be (re)configured to encompass the changes," he advises.

Ian Beushaw, head of digital media at itfc, suggests that although DAM systems have developed rapidly over recent years, challenges of automation, speed and cost efficiency still remain. "Broadcasters are looking to improve the speed of their connectivity and quality of their global distribution, and want to be able to access their DAM system online for compliance, press, promotion and long term storage. In terms of the big data handled by broadcasters, the challenges posed by automated delivery chains, metadata exchange, standardising formats and file integrity still remain."

AUTOMATION. Bearing in mind that there is much less revenue in television available these days, he recommends that Digital Asset Management systems must aim to automate the processes as much as possible, making them more efficient both in terms of time and cost. "In other words the answer is to try and create a fully automated, end-to-end system, which can, to some degree, address all the demands of broadcasters. In answer to this, itfc have developed the Core system, which includes automated end-to-end file process delivery, full file management and access, auto generated metadata and high speed connectivity between Deluxe global locations. File management and storage are administered by archive robotics systems."

Brad Redwood, vice president of international sales and marketing at Masstech, recognises that in today's fast-paced broadcast industry, media and entertainment companies – be it broadcast or news channels – are charged with assembling the most relevant media content as quickly as possible. "The speed of media asset management (MAM) along with high-quality speed (HQS) transcoding and bridging of digital workflows directly affects competitive edge in the marketplace for news, production and broadcast organisations that create and distribute rich content," he notes. "To maintain high levels of productivity, staff members require an alternative to the manual process of hunting down videotapes in the archive library before previewing the content and then taking the tape to the editing system to dub or ingest it before editing. Broadcasters that still utilise videotape-based archiving systems have slow access to valuable resources, which can compromise productivity when putting programmes together on tight deadlines. Broadcast editors need to be able to rapidly preview, access and assemble programme content straight from their desktop," he suggests.

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PETER ELVIDGE, GLOBECAST UK

Mike Nann, director of marketing and communications, Digital Rapids, reveals that as a provider of workflow and media transformation solutions that interface with Digital Asset Management solutions, rather than DAM solutions themselves, one of the requirements he is hearing most often is the agility to quickly and easily integrate new formats, standards and support for compliance requirements (such as new requirements for Closed Captions in online video) without requiring a major overhaul of users' workflows and processes. "Another key requirement, of course, is robust handling of metadata -while content may be king, it's the metadata that facilitates monetisation at a business level, while also enabling more intelligent workflow automation and efficiency at a technical level. These are some of the key tenets behind our latest generation of workflow and transcoding solutions."

PRODUCTIVITY. "To accelerate MAM tasks and boost productivity, media outlets and production houses require a unified suite of software tools on a cost-effective platform in order to streamline and optimise digital workflow processes for every stage of media asset management, advises Masstech's Redwood, adding that the real challenge for MAM vendors and developments lies in bringing real life workflow tasks closer to every user and providing them with functionality they need, without the high costs.

For Peter Gallen, Tedial's solutions architect, it is undoubtedly true that broadcasters cannot realistically achieve their business objectives without using new tools and changing working practices. "Consequently the use of DAM or MAM systems can no longer be seen as optional, but as essential in order to help in managing the proliferating media versions that accompany multi-platform delivery."

He notes that there are now a number of mature DAM systems available ranging from quite basic products to more comprehensive ones and these are available at prices to suit the target customer's requirements. "The technologies that comprise a typical DAM are now

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> **TOMAS PETRU, VISUAL UNITY**

well understood so that most systems will bring measurable benefits to both smaller and larger organisations. However, the 'elephant in the living room' so to speak is the common lack of effective workflow management tools deployed in broadcast programme production. Broadcasters readily understand the requirement to integrate systems in order to move content through Acquisition, QC, Post-Production and Archive. However, in many cases, they do not realise that without tightly controlled workflows, they are unlikely to reap the full benefits of a File-Based system let alone benefit from the incremental improvements in operations that proper workflow auditing and reports can deliver," he observes.

MANPOWER. He asserts that broadcasters understand that they will require better tools and effectively integrated systems (File-Based workflows) in order to do more with existing or slightly increased levels of manpower. "The use by broadcast system vendors of standard IT technologies such as XML file exchange and connecting sub-systems using Web Services combined with maturing DAM technology, means they are more likely to be able to fulfil these expectations," he suggests.

Tomas Petru, MD, Visual Unity, notes that the challenge for broadcasters is to adapt to the rapid changes that are taking place in the multiscreen and mobile world. "The issue is less about technology but more about the programme and monetisation side, and delivering a user (viewer) experience that can support more live content on multiple screens. Most of the demand we see from broadcasters, both in the form of formal RFI/RFP or during discussion, comes in silos, and there is very little bridging among them. There is multiple DAM in each organisation, and by DAM each department understands something quite different, with different content, metadata, workflow, security, *etcetera*," he reveals.

He cites the example of a major public broadcaster where Visual Unity manages all of the Internet video. "In order to build the news clip for the web site we have to collect data from multiple DAM systems. This involves going to the planning system (which can definitely be called DAM) for basics metadata, rights and basics timing; to the newsroom system for the headline and description; to the control room system for the actual content as a combination of studio and clip, and finally to the playout system and newsroom system to get the frame-accurate information to produce the final clip," he says.

REALITY. "All of these systems are definitely DAM, but they are not connected and in reality often don't have even single unique ID accompanying the content and its data. In my opinion, many of the vendors are resolving the situation by sticking with what they know, and protecting the lost ground. Such an approach can only lead to expensive and obsolete workflow increasing both OPEX and CAPEX costs," he warns. "Visual Unity's approach is different – we help broadcasters overcome these issues by bridging the broadcast, IT and mobile world, which we can do because we have with extensive experience in all of them," he claims.

Stuart Cleary, EMEA product director of digital media, Akamai, admits that delivering video assets to consumer devices nowadays is a tremendously complex task. "The number of devices and formats to cater for is staggering, and with a projected 20 billion consumer connected devices expected by 2020, complexity will be exponential. Delivery to multiple connected devices and runtimes today requires management of multiple media formats with varying optimised encoding settings," he says.

Dalet's Cospen suggests the MAM also makes it easier to organise assets as they relate to one another. "We see this a lot in newsrooms where the emphasis is shifting from a channel-centric view to a more global perspective. Instead of creating a piece for the 6 PM news, journalists now view their assignments in a way that serves the organisation and all the different content outlets as a whole. It's a 'story-centric' approach. All the elements of a story - images, background information, logos, short or long text versions, URLs, related items, *etcetera* – reside in a virtual container. Any user who needs content about that story has everything immediately available so they can easily repurpose the content, add or delete different elements to best suit different platforms. This approach offers unlimited possibilities to keep content fresh and relevant. We are also seeing this shift from a channel-specific focus to an asset-centric global view in sports production and programme management workflows as well. The organisational foundation of the MAM system makes this possible," he notes.

SEAMLESS. He notes that customers are very insistent about integration and agility, as understood in IT terminology. "Integrations need to deliver real interoperability and efficiencies. One example: you have a resource management system on one side, and a MAM system on the other side. When you schedule an event and you book a satellite link, you want the recording session for that event to be created automatically in the MAM system. If you have to create that same recording in the MAM manually, you are adding a repetitive task and also inviting the opportunity for errors. You also want to have the valuable metadata in the resource management system transfer directly into the MAM without having to retype them. This is why the system must be open for seamless integrations. We are constantly developing and enriching our Web Services APIs and providing multiple ways of opening our system to third-party systems," he says.

"The second point is IT agility. You want to quickly adapt to new technologies without negatively impacting operations. For instance, it should be easy to plug in the latest version of a third party converter or to create new metadata schemes when new fields are required to

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ingest content or to push content to a new delivery platform. Dalet has adopted a Service Oriented Architecture (SOA) that relies on 'standard' connectors with ESBs and third party systems and that complies with emerging standards such as MXF AS-02 and FIMS, to name just a few."

He reveals that Dalet works with more than 60 technology partners (automation, video servers, storage, converters, media movers, media processing, traffic, etc.) to achieve this type of interoperability, adding that integration and agility ensure the longevity of your system and protects the investments you've made in it.

RIGHTS. Given the increasing complexity of delivery and device requirements, how do DAM solutions cope with rights spread across multiple channels and screens? According to GlobeCast's Elvidge, rights management nowadays is often hived away in its own (often very legacy) system, or its part of a business management, scheduling or traffic system. "Rights data within the actual working systems often tends to be a subset and often not stored in a machine-readable format such that it can be automatically checked as part of delivery workflows. However our experience shows more and more broadcasters understand that the best way forward is not to look for a single software solution for everything (the old fashioned monolithic MAM/DAM concept) but instead to think about how 'best of breed' solutions can be integrated in a highly modular approach – each application excellent a specific task, such as rights, media workflow, transcoding or delivery," he recommends.

Cospen suggests that structured metadata schemes and the flow of metadata between systems in a non-destructive way are key points. "Rights information typically originates from some type of traffic system or an external rights/business management system. This crucial information needs to flow throughout the lifecycle of the media, including the production chain. The metadata structure can't be 'flat' or one-dimensional. You need structured metadata schemes that can take into account all the different scenarios for usage and rights. Perhaps only a particular version of a show can be free to air or on the web. Or, maybe it can be used only during certain time periods on some, but not all mobile platforms," he suggests.

"The MAM needs to be 'intelligent', recognise these constraints and notify the operator of any conflicts. You also need to preserve and enrich the metadata as it flows through different systems, such as NLEs. For instance, a production piece can include materials from different sources which may have different rights. You need the information about each element in that piece to flow back and forth between the NLE and the MAM in a non-destructive way. In Dalet, the specific metadata including the parent/child relationship for each element is linked directly to the timecode. Warnings notifying a user about any limitations can also be generated before publication. These are very important issues for handling rights across different platforms," he states.

ACCESS. According to Harris's Eyles, Harris DAM offers seamless integration to a house-standard, Windows domain managed enterprise, allowing for content and functionality access rights to be managed centrally. "This is vital for network and multichannel broadcast facilities to secure content and access between channels and services," he stresses. itfc's Beushaw points out that asset management systems can actually now be connected to broadcasters' rights management systems. "This means that live rights changes can now be kept automatically up to date within an organisation's DAM service provider. This automated process cuts out the need for multiple manual entries and ensures that once material is out of rights, it cannot be distributed," he says.

Masstech's Redwood suggests that regardless of the storage technology deployed, MAM systems typically use a combination of security matrix, group policy and rights management tools to cope with multiple channels and clients, and that an efficient LTO tape archive will provide partitioned, protected storage for multiple content owners.

Tedial's Gallen agrees that the provision of comprehensive rights management in DAM systems in broadcast has been for years a difficult subject. "Most DAM systems have the capability of storing and displaying basic rights as standard, but these do not usually represent the true complexity required to track rights across different timeslots in multiple territories. There are some comprehensive systems available in the market, but by and large they are rejected by broadcasters on grounds of cost, typically rivalling the cost of the DAM system itself," he advises.

COMPROMISE. "The tendency has been to retain the existing manual methods to manage the fine detail while perhaps depending on the DAM to provide a simple traffic light system to warn of potential problems. This represents a good compromise for potential buyers of DAM systems giving sufficient coverage for the majority of everyday requirements without the cost of an expensive dedicated rights management solution," he suggests.

Visual Unity's Petru feels that rights across multiple screens are definitely a frustrating challenge but doesn't feel that this is necessarily a DAM issue (or that it create any issues for well architectured DAM).

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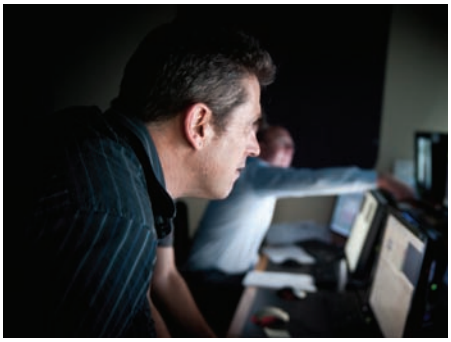

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IAN BEUSHAW, ITFC

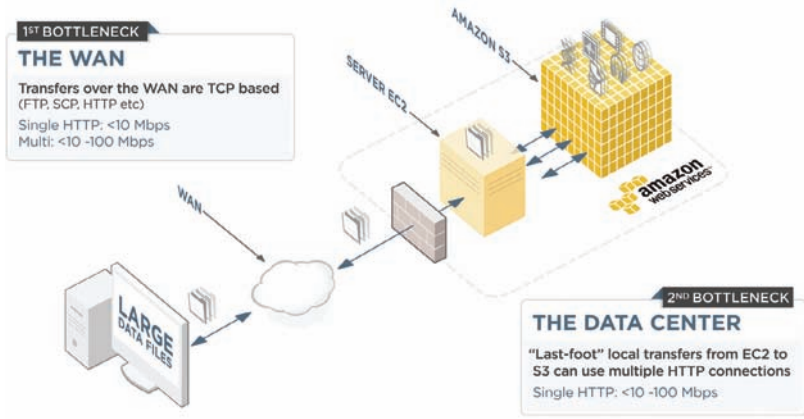
"Instead I think this is an issue for content owners and their brokers who still haven't figured out how to monetise content in this new world. A clear example has been set by Apple and Amazon, which handle digital rights in a straightforward way that allows massive monetisation via individual consumption, i.e. through the personalised user experience as provided by multiscreen solutions."

"However, the content industry still does not want to give away its bundles and bulk policies that allow them to sell worthless hours of content by packaging it with something shiny. This change in consumer behaviour is obvious across a number of industries, and the examples in the broadcast world are set. So the solution has to start with business planning and programming. DAM will just implement the business practice that is set by these processes, and then deliver them based on these rules," he predicts.

CLOUD. Much talk nowadays surrounds the implications of the 'cloud' in all aspects of broadcasting. Could DAM in the private cloud be a solution, or even third-party managed solutions in the public cloud for some deployments?

Aspera's Heitmann says that the cloud has held great promise, with an on demand, scalable, pay-as-you-go model to scale out computing and storage capacity. "Compared to an in-house datacenter, the cloud eliminates large upfront IT investments, lets businesses easily scale out infrastructure, while paying only for the capacity they use. However, for big data such as the rich media stored in digital asset management systems, the cloud has not been an option because of the inherent bottlenecks in moving the big data over the cloud infrastructure and storage. Companies that deal with rich media have at most used the cloud for long-term archiving, and have been unable to leverage the cloud for file-based workflows using a DAM solution," he notes.

Akamai's Cleary points out that 'In the network' packaging and segmenting from Akamai is a cloud-based media preparation capability that simplifies video workflows so content publishers can efficiently deliver more content to the growing number of devices without added complexity to your existing workflow. "By leveraging this capability in the cloud, the content provider can mitigate the need to manage and deploy separate workflows for every single device and format they are targeting, ultimately contributing to the simplification of their asset management workflows. Cloud platforms, such as the HD Network, can help to simplify these workflows," he suggests.



ELASTIC. Cospen says that Dalet's customers using the cloud primarily as a way to extend their internal production for special projects or to expand their storage capabilities. "For instance, during the Olympics you may have large amounts of content to ingest and run through quality control. You may want to use the cloud for a fixed period of time to perform QC. The cloud is 'elastic' meaning you only pay for what you are using and that may be more cost-effective than building out a facility to handle the extra workload. A different example can be seen at Canal+ i>TÉLÉ, which has externalised its archive to a cloud where authorised users can search the database, browse and download content. In all cloud cases, security issues need to be addressed, and for HD video there are some concerns about bandwidth," he notes

"Another possibility is offering MAM as a service in the cloud. Dalet doesn't provide this type of offering, but we do make our MAM platform and tools available to broadcast and IT integrators, such as Video 8 in Australia, who want to host a cloud-based MAM for their customers. All of the Dalet solutions comply with the requirements for cloud deployment and they've also been tested in the cloud environment," he says.

Eyles notes that broadcasters increasingly demand access to transaction-based functionality, paying for functionality as an on-demand service confirming that Harris DAM supports private or public cloud-based services as part of its existing third-party plug-in and SOA based architecture. "The simplest form of a private cloud is to virtualise key servers in a standard environment (VMware, Microsoft Hyper-V *etcetera*)," adds Worman. "This is already available today and in use in many organisations. It is not a huge step from this to using a more generic private cloud or even public offering. However, the key issues today are still the raw bandwidth to manage the main video and audio essence. As with most technology based on Moore's and more specifically Nielsen's Laws, this will be overcome in time (and in some cases is already possible)," he suggests.

FUTURE. "This leads to a more intangible issue of whether the broadcaster will accept that their content (or even just the metadata) is held in locations outside of their premises. Further, the current market for cloud storage is still very young and with its international scope is still the subject of ongoing legal clarifications. Until these are confirmed to a satisfactory level, it would be wise not to rely on such a system as the primary source for content or metadata."

Beushaw notes that itfc's 'Core' is an effective privately-owned cloud. "Cloud based solutions are the future; they are the most cost effective solution, and essentially involve much less capital expenditure and avoid ongoing management, maintenance and upgrade costs. This, of course, is on the proviso that the cloud is secure and accessible," he cautions.

Gallen advises that putting content, or more likely proxy versions and metadata into a private or public cloud

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could provide benefits in terms of making audio visual material widely available, but would require DAM technology to track instances, not least because original SD and HD programme files are too large to be a practical proposition and will remain grounded in traditional storage systems. "Some DAM systems have been designed to work using proxies wherever possible so that the high-res files are delivered only when they are really needed. To achieve this, the proxy files generated by the DAM system must be frame-accurate and must behave exactly like the original high-res versions. The DAM solutions that are able to offer these capabilities are logically more suitable for use in cloud-based or Software as a Solution (SaaS) projects," he advises.

BOTTLENECKS. Petru considers there are places or set-ups where it makes perfect sense, and others where it does not. "If the cloud is developed so that there are no bottlenecks, then outsourcing this technology management issue and focusing on the core business makes perfect sense. I am aware of some fantastic and profitable channels that are run by a few people who are focused just on the programme and business, while all of their technology lives somewhere in the cloud."

Akamai's Cleary suggests that the cloud can offer the opportunity to manage security mechanisms such as encryption for the content. "Akamai today offers customers the ability to take advantage of a service called SecureHD that applies per session key encryption to the video asset at the edge of the Akamai HD Network, before it is delivered to the consumer device. Again, this mitigates the need for the content provider to manage an encryption workflow at their origin, or manage multiple encryption technologies for different formats. The goal here is to simplify security workflow for the content provider and to help reduce workflow costs," he says.

STANDARDS. With content arriving from many sources, will format and metadata standards be achieved to smooth the management of this increasingly complex segment? "Having standards and protocols is always helpful," admits Cospen. "But our industry is not static. There is always something new – a new content provider, another distribution platform, a different format. In each case you need the flexibility to quickly add new metadata fields so you can automatically input important metadata."

"Broadcasters no longer wish to allow proprietary architecture and interfacing to dictate functionality."
TIM EYLES, HARRIS

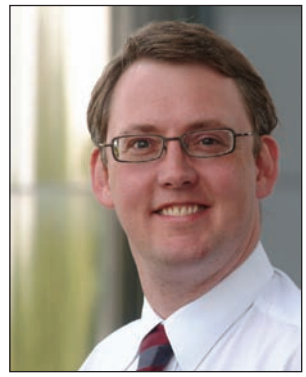
Eyles suggests that by its nature, DAM seeks to centralise and index metadata while referencing content and object-based data in an efficient and resilient manner. "Harris DAM supports and adheres to many existing metadata standards while remaining agnostic to proprietary formats and wrapper variations. In a changing and developing environment where new formats and standards are inevitable, it is vital that digital asset management evolves to adapt to the complexities of the segment," he states.

Beushaw says that one of the biggest management problems for a broadcaster and broadcast service provider are the multi different incoming formats. "Dealing with this currently involves having to buy lots of different kit to standardise delivery formats and although formats such as the AS11 Spec may go some way to addressing issue, until all content owners are providing their content in the same format, there is still some way to go," he warns. "The main problem lies with metadata; broadcast facilities still have different metadata schema for automated file receipt and asset management data population. To standardise it entails so many different requirements and trying to combine them is a real challenge for DAM system producers. It's one of the key areas that currently needs more development," he states.

EFFICIENT. Redwood advises that broadcasters need to manage dynamically all media and its associated metadata from ingest to editing to playout, without multi-vendor integration issues. "Building complex rich metadata harvesting systems that generate truckloads of superfluous data that also has the effect of stifling the adoption of file-based workflows. To address these complexities, using media asset management software that transcodes various file formats and has multiple interfaces to a wide range of broadcast devices, NLE platforms, broadcast control systems, and web-based MAM tools will help bridge production, transmission and digital archiving to make broadcast operations more efficient."

Gallen suggests that the use of file exchange using 'standards' such as MXF that can deliver content and metadata in agreed ways has become more common thanks in part to work done by the Advanced Media Workflow Association (AMWA). "However the adoption of such techniques is typically slow in the broadcast world," he admits. "In the meantime, many DAM systems are deployed using customised metadata models rather than adopting any of the few standards that are available in the DAM space. The key here is to select a DAM platform that is flexible enough to adapt to the metadata requirements implicit in all types of media production."

"Vendors can help by providing tools that are flexible and can easily be (re)configured to encompass the changes."
PAUL WORMAN, HARRIS



According to Dominic Jackson, product manager at Telestream, format and metadata standardisation is unlikely to simplify things. "Historically, the number of formats has grown continuously since digital video began, and will likely continue to do so. We typically find that asset management solutions require associated transcoding solutions, not just to handle diverse content sources, but also to handle repurposing content coming out of archive and for tasks such as generating the proxies that most systems require," he notes.

FRAGMENTATION. Digital Rapids' Nann suggests that even given the standardisation initiatives currently underway, such as MPEG-DASH for distribution over adaptive bit rate technologies, it's highly likely that users will need to continue to deal with multiple format and metadata standards for the foreseeable future. "And if audience-generated content is part of the media mix (as may be the case with news organisations receiving clips from 'citizen journalists', as they're called in North America), it's often the case that the clip may arrive missing much of its necessary metadata. With all of that in mind, one of the most important factors for Digital Asset Management is to that the media transformation technology (such as a transcoding platform) that the DAM integrates with is flexible and agile enough to allow quick, easy integration of new formats and standards, and robust enough to maintain rich metadata throughout the content value chain in whatever standard are required by the particular destination or application," he advises.

Petru admits that if he were to bet, he'd rather put his money on even more increased fragmentation. "Part of our technology is mobile device recognition, and we have distilled over 4,000 families of devices with close to 10,000 different kinds of them. Even though certain standardisation may be hoped for, I believe it is slower than the development of the video devices segment as I see many new devices added to our database every week."