

# “Thoughts On...” Commentary Series



## Digital Media Supply Chain Management

### Executive Summary

Through the innovative use of new digital technologies, the Media & Entertainment (M&E) industry has a very different competitive landscape than found in the earlier vertically-integrated supply chain that was developed for analog media production and distribution. Technology has lowered the barriers to entry, broadened distribution to a global audience, and democratized media production. It is also enabling a reevaluation by media, telecommunications, computer, and IT service companies of their positions in a constantly changing industry value chain.

The M&E industry has been discussing and implementing various forms of Digital Supply Chain Management (SCM) systems for several years now. Building upon earlier efforts, most major studios have some strategic initiative in the space. The goal of SCM is greater visibility in the operations across the entire supply chain to optimize materials ordering and inventory management, and to improve demand projections. Perhaps the biggest inhibitor to cross-industry SCM is the initial distrust among industry players and the need to control proprietary company information. When considering outsourcing aspects of operations, CIOs and CTOs need to evaluate how easy and/or willing they are to share (or get) the information from business partners in the supply chain and consider what conditions, policies, or processes need to be in place to make doing business with Cloud-based outsource partners, for example, as easy (or easier) than doing business with in-house departments. Industrywide Digital SCM for M&E might also require further standardization and adoption of the following:

- Universal identifiers that are unique and permanent across media applications, platforms, and services
- Global registry or index of media objects, devices, systems, companies, and users
- Common metadata across media types and applications
- Audit trails for the distribution of media back up through the production value-chain
- Customer Relationship Management (CRM) systems to track media usage and consumption patterns in a non-invasive, privacy-assured manner
- Owner-definable policies for authorization and access controls to media and services
- Management and enforcement of rights and associated royalties
- Forensic traceability of media leakage, rights violations, and piracy abuses.

Digital media can be a transformative catalyst for global enterprises. However, business transformation has a profound effect on people, infrastructure, and operations. STI can help further ensure clear alignment between the digital media technology strategy and the overall company's business strategy. This approach allows STI's clients to focus, not just on efficiency and cost reduction, but also on the power of digital media as an enabling force for new businesses, new markets, new revenue streams, and organizational transformation.

## Background and Definition of Supply Chain Management

### SCM's Manufacturing Systems Legacy

For the sake of discussion, let us define Supply Chain Management as systematic improvement in the way a company finds the raw components it needs to make a product or service and deliver it to customers. There are five major components of most SCMs, according to Thomas Wailgum and Ben Worthen.<sup>1</sup> They are: Plan, Source, Make, Deliver, and Return.

CIOs in the manufacturing industry are very familiar with these SCM processes and systems. They have evolved SCM systems over the past 30 years to automate and optimize the supply chain within their own enterprises and among their trading partners. The planning function might use an Enterprise Requirements Planning (ERP) system, such as SAP, and it might also be integrated with a Computer-aided Design (CAD) and/or Computer-aided Manufacturing (CAM) system. Sourcing materials, making the product, and managing the work-in-process might be done with the assistance of some type of Materials Requirements Planning (MRP) system and inventory control system. The raw materials suppliers will be paid with an Accounts Payable system. CAD/CAM systems help automate the factory floor operations according to Just-in-Time (JIT) and Lean best practices. Delivery operations are managed with the help of finished good Inventory Control and Logistics systems. Customer Relationship Management (CRM) systems are integrated with Accounts Receivable systems to collect payments and handle customer support issues, including returns of defective products.

Figure 1 -- Automated manufacturing operations. Photo Source: Environmental Service Systems, LLC. Used for illustrative purposes only.



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<sup>1</sup> Thomas Wailgum and Ben Worthen, writing in CIO Magazine 11/20/08.

This well-designed workflow and tight linkage of support systems can help create highly efficient manufacturing operations within a company. However, modern supply chain management had to evolve beyond the company walls to include a broad array of external business partners. COIs and CTOs have overcome this challenge before.

- 30 years ago, early investments by insurance companies, hospitals, and the government to manage documents has allowed these industries to scale significantly without drowning in a sea of paper.
- 25 years ago, automotive and aerospace companies moved in this direction to allow teams of designers, engineers, plant operations personnel, and marketing staff to work together. They then extended their internal networks outward to include parts suppliers and contract sub-component assemblers.
- 20 years ago, the software industry did the same, using CASE tools and collaborative development environments.
- 15 years ago, it was Entertainment's turn to adopt a digital infrastructure and a non-linear development approach. Led by pioneers in visual effects and animation, such as George Lucas' remake of the *Star Wars Trilogy* and Jeffrey Katzenberg's use of asset management systems in the making of the *Prince of Egypt*, Digital Asset Management (DAM) systems started finding their way into studio production.
- About 10 years ago, video servers began to enable simultaneous access to editable media.<sup>2</sup> More robust content can be assembled from diverse information sources. Along with significant expected cost savings, the widespread accessibility of video assets allows employees to focus instead on critical tasks, such as research and consultation.
- Of course, with the explosion of the Internet in the early 2000s, with web content and advertising, numerous solutions came to market to support web commerce and media streaming. Throughout the decade, also saw specialized media service companies beginning to offer outsourced expertise and shared services platforms in various stages in the industry value chain.

Table 1 -- Adoption of industry-specific aspects of SCM

**CIOs and CTOs Have Done This Before:**

30 years ago – Paperless Office

25 years ago – Factory Automation

20 years ago – Software CASE Tools

15 years ago – Animation & Visual Effects

10 years ago – Broadcast Servers

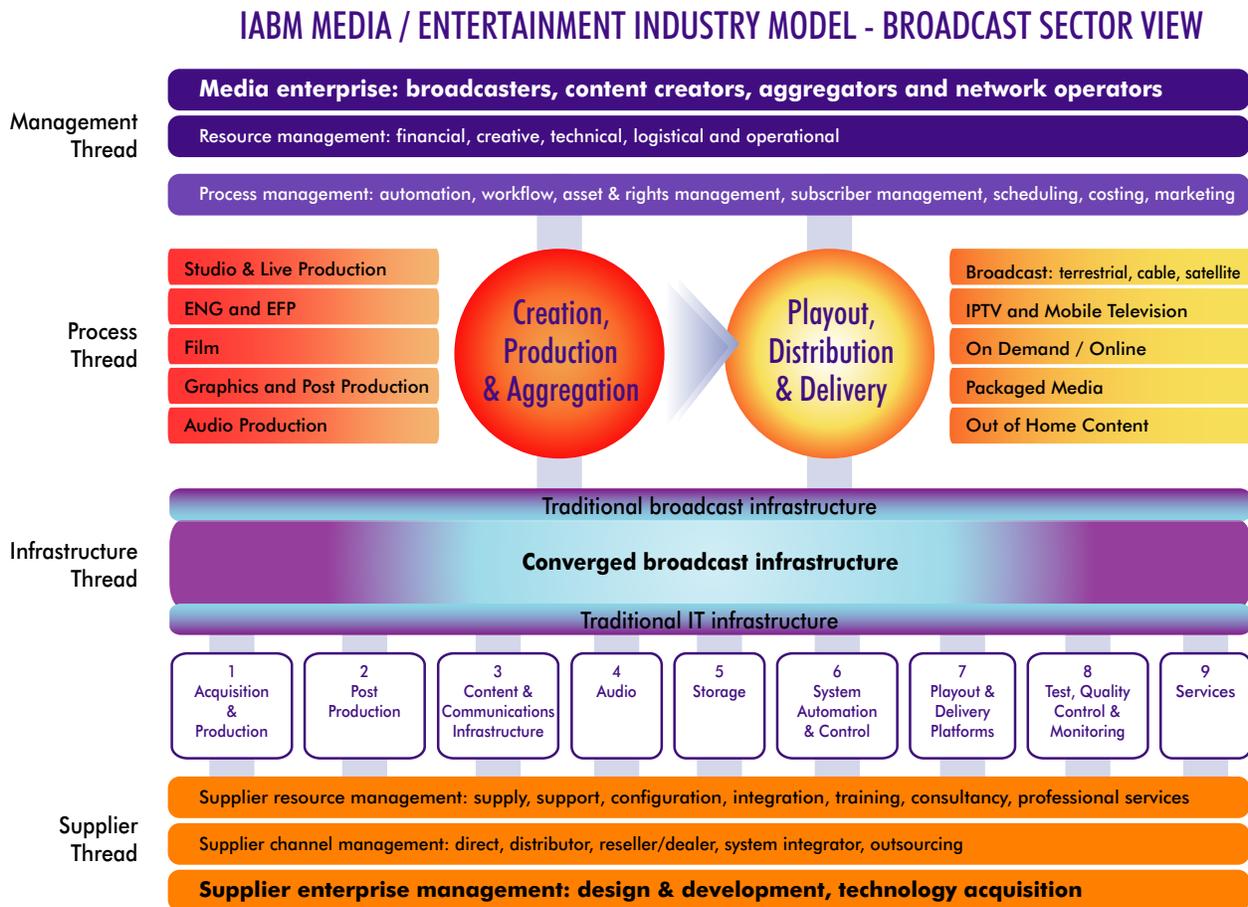
8 years ago – Dot Com E-Commerce and Content Management for Web Portals

<sup>2</sup> The Cable News Network (CNN), one of the largest and most profitable electronic news and information companies and the world's most extensively syndicated news service streamlined its business and sharpened its competitive edge by implementing an Informix®-based media asset management solution on an SGI Origin video server. This innovative application allowed approximately 300 editors, writers, and producers to search and browse video from up to 40 simultaneous satellite feeds in real time and from their desktops. This application also analyzed more than 25 live video programs an hour, 24 hours a day. Each video program was designed to be viewable and its key frames searchable, which allowed CNN staff to meet their stringent news deadlines. On a week-by-week basis, the system processed and indexed more than 12,000 video clips, key frames, and timecode-indexed textual information.

## Digital Technology’s Impact on the M&E Value Chain

For about 70 years, the M&E industry operated according to a very well-established model. Each major player found itself a way to dominate a portion of the industry value chain – in the creation, management, distribution, or presentation of media. The largest players sought to be fully integrated across this value chain.

Figure 2 -- An example M&E value chain. Source: IABM, 2008. Used for illustrative purposes only.



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However, about 15 years ago, this stable value chain began to change; and it continues to accelerate today.

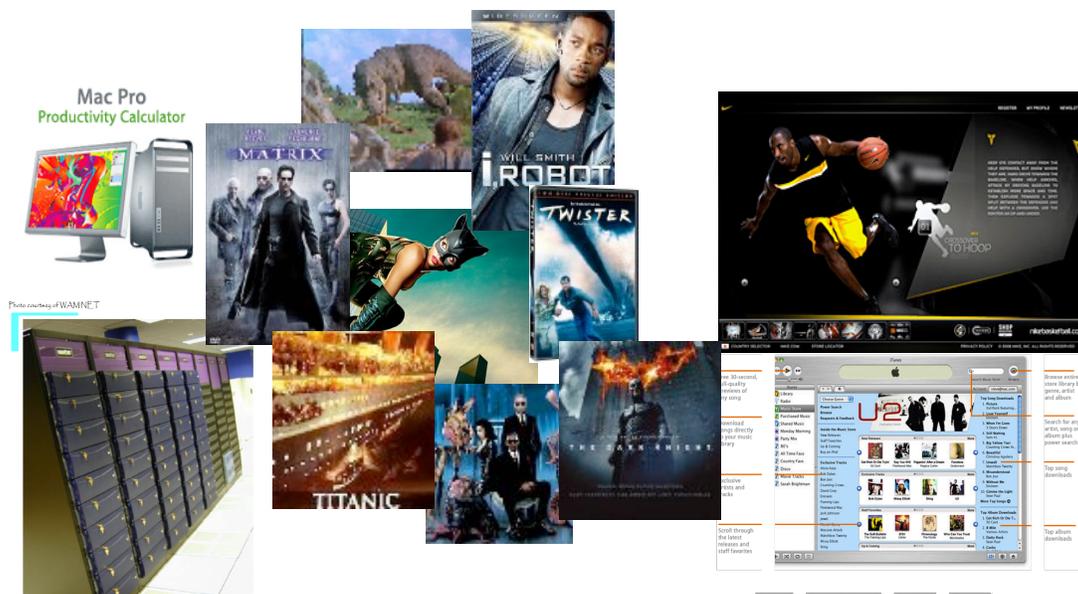
- There is increasing acceleration in the movement from physical to digital assets. Media is being captured, enhanced, edited, stored, distributed, and reused in digital form. New platforms allow consumers to choose when, how, and where they will consume content.
- Content owners became interested in offering their material as widely as possible and platform owners are searching for the most cost-efficient methods of delivery, including: web presence, broadband TV channels, on-demand access, and distribution to mobile devices.
- Globalization is affecting both the production and consumption of media. While media becomes global in nature, it is consumed locally. The emergence of local content and the participation of consumers in the creation, selection, and consumption of media will continue to affect supply and demand.

Generally, in addition to the specialized content creation platforms, compositing systems, editing bays, and playback systems, a comprehensive Digital Media Management (DMM) infrastructure will include functions that support the creative production workflow. Key components include, but are not limited to:

- DAM - Digital Asset Management Systems address access control, change control, versioning, metadata management, and storage of media, generally handling the work-in-process. Its goal is workflow cost reduction and operational efficiency.
- MAM -- Media Asset Management Systems perform the same role as DAM systems, but MAMs generally handle the finished product and promotional materials associated with the finished product.
- DRM - Digital Rights Management Systems address content protection, content licensing rules, and the enforcement of those rights and rules.
- CDN - Content Distribution Networks address external distribution workflows.

Computer-based media servers are the foundation of DMM infrastructures. Asset management applications are the central hubs of production management, distribution preparation, syndication management, rights management, and security. These applications and services catalog, index, and annotate original content as well as facilitate the repurposing and the search and retrieval of rich media content. Servers can tie separate departmental operations together. They also let directors find the single clip or animation sequence needed among the 3-5 million digital files commonly found in a fully digital feature. They can also allow producers to leap over traditional studio methods of rigid linear operations to a more effective and efficient collaborative work style. In broadcast newsrooms, more robust content can be assembled from diverse information sources and DAM servers enable simultaneous access to editable media. They allow for video content to be incorporated into enterprise databases and integrated into other IT applications. Along with cost savings, the widespread accessibility of video assets allows employees to focus instead on critical tasks, such as research and consultation.

Figure 3 - Examples of the impact of digital technology on the M&E industry. (Theatrical images are properties of their respective film studio owners. Other images are courtesy of Apple, WAM!NET, and Nike. They are used here for illustrative purposes only.)



Due largely to the adoption of digital technology and digital workflows, in the new world of M&E, consider what business transformation has occurred.

- Production can now be in smaller studios; virtual sets can replace real sets; portable HD cameras give more options for shots on-location; and programs are not solely dependent on their own productions (they can include user-generated content as part of the mix).
- Capital has a very different implication when small production companies can develop high-quality productions with inexpensive computer-based tools. Fifteen years ago, SGI sold high-end supercomputer workstations at \$250,000 to \$500,000 per system for visual effects in *Jurassic Park*, Will Smith's *Independence Day*, and the remake of *Star Wars*. Today, similar capabilities can be found in a G5 Macintosh bought on a credit card at your local Apple store.
- Work is done with less people. The older generation of Hollywood studios had employee and contractor bases around 3,000 people. The newer generation of production studios, who heavily use computers as their creative tools, do the same job with around 500 people or less. Where the traditional production process relied on a linear workflow performed by singularly skilled unionized or guild-supplied labor, we have an industry where the workflow is nonlinear and iterative, is performed by multi-skilled crews, and freelance labor is abundant. This lets the boutique studio both compete and collaborate with major studios.
- We have also seen a changed distribution infrastructure in M&E, which is more like IT and telco services that can be outsourced and paid for only when the services are used.
- Distribution is no longer captive due to options for web and wireless web-based services. No longer are government licenses required for distribution, because IPTV, iTunes, YouTube, and Podcasts bypass the public airwaves and make use of the internet for distribution.

Through the innovative use of new technologies, we have a very different competitive landscape – one that lowers the barriers to entry, broadens distribution to a global audience, and democratizes media production. It is also enabling a reevaluation by media companies of their positions in a constantly changing industry value chain.

## SCMs in the M&E Context

The M&E industry has been discussing and implementing various forms of SCM for several years now. Building upon earlier efforts, it is fair to say that most major studios have some strategic initiative in the space. However, what each studio means by Digital Supply Chain, from a B2B perspective, is subject to the context and goals of their particular strategies.

For example, Disney's most visible efforts may have been in the Digital Cinema space.

*"The notion of shipping, warehousing, reclaiming, restoring, and destroying reels of film will one day, potentially sometime in our lifetime, become obsolete. This will happen in favor of a digital system where everything from the way the camera captures the image, through the method the content is edited and cut into a final product, to the manufacturing process for distribution, which will most likely occur on DVDs, distributed through satellite or another form of terrestrial distribution. It will have a dramatic impact on supplier relationships and infrastructure supporting all that supply chain.*

*- Bill Patrizio, Senior VP of Strategic Sourcing and Procurement, in an Information Week interview.*

Warner Bros has focused on the End-to-End production and post production capability.

*"The future entertainment environment will be digital — from end-to-end."*

*- Chris Cookson, Former President of Warner Bros. Technical Operations, referring to the Digital End-to-End (DETE) project.*

Sony's current *Digital Backbone* project seeks a digital file-based workflow across the production and distribution infrastructure.

*Sony Pictures Entertainment has opened a full-service digital intermediate (DI) facility located on its historic lot in Culver City. Colorwork's digital file-based workflow leads the studio's development of a digital production and distribution infrastructure called the Digital Backbone."*

- Sony Pictures press release, 11/16/2009.

In the B2C context, Comcast Media Center's vision is one of a supply chain that allows Comcast to be a Media Management Agent for their subscribers.

*"In addition to selling and delivering content, media and communications companies will need to provide new services that allow their customers greater access to personally relevant content. Today's media companies will need to become something more than just content retailers. Getting to this next step in the evolution of the service provider relationship will require companies to become Media Management Agents (MMA)."*

- Mitch Weinraub, Senior Director of New Media, Comcast Media Center at SCTE-ET.

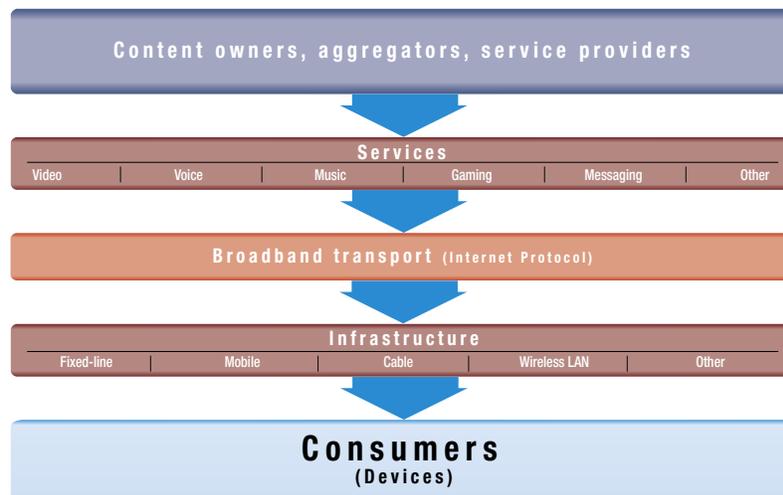
Apple's iTunes supply chain has been so successful, it is now seen as the dominant music industry storefront.

*iTunes' supply chain investments provides the company with significant information on demand patterns. In turn, it's using its supply chain to develop new products and services. It is a platform for higher margin hardware sales, increased agility through higher cash flows, accelerated turnaround times with on-demand content, and speed to market through a recognized web-based store front.*

- C.J. Wehlage of AMR Research

So, let us define Digital Supply Chain Management as the systematic improvement in the way a media company finds the raw components it needs to make a digital content product or service and deliver it to customers. However, the media value chain itself is becoming more complex. Specialization in the value chain is accelerated by convergent technologies in combination with global sourcing, greater attention to differentiated needs of consumers, and improved access to a broader talent base. New players and business models are restructuring value chains, where money and assets flow in non-traditional ways. We now find large phone companies wanting to become cable companies. Cable companies started becoming production studios. Production studios started being more interested in distribution and marketing.

Figure 4 -- Converged Media Value Chain. Source: PricewaterhouseCoopers. Used for illustrative purposes only.



As departmental stovepipes give way to content-centric media companies, SCM needs to adapt to a converged industry value chain -- one that allows all content to be delivered across any physical infrastructure to any device, and reverses it to allow for UGC (user generated content) to be submitted to aggregators and service providers

Gone are the days when a broadcaster could package up a program lineup, push it out to the mass market, and count on eyeballs. Today, the model is increasingly inverted. Consumers have more to say about: what they see, when they see it, where they want to see it, on what platform they want to view it, on which pricing terms they will accept -- and they want to share the content with friends. They want to produce and distribute their own content, and they often find that more "entertaining" than content pushed at them.

Figure 5 -- The consumer is increasingly in control, so the supply chain has to adapt to more ways to serve the consumer.

*(Images are properties of their respective owners. They are used here for illustrative purposes only.)*

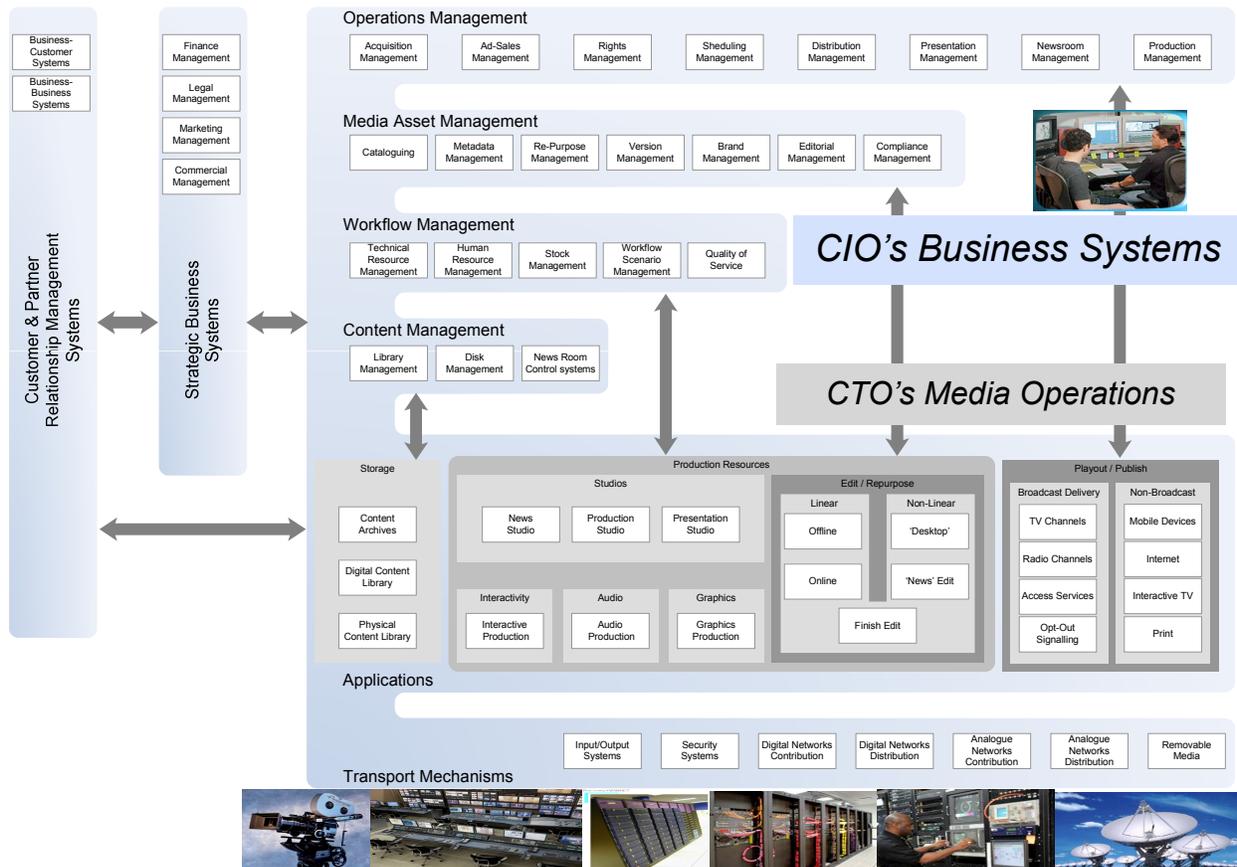


## Gaps in M&E SCM Capabilities

As the industry value chain evolves, it exposes gaps in the traditional EMC supply chain, including:

- Its inherently analog nature grew out of the analog movie production process.
- Remnants of departmental silos, or in some cases "kingdoms," makes it difficult to get proper visibility across the whole enterprise.
- Tight vertical integration of major corporate functions makes it very difficult to manage a flexible collaboration among dozens of external production and distribution partners.
- In most large Hollywood studios, national broadcasters, and global media conglomerates, there has been an unfortunate history of separation between the world of the CIO and that of the CTO or Technical Operations organization. Digital technology and the business imperative for corporate-wide optimization of systems and workflows are breaking down those traditional walls.

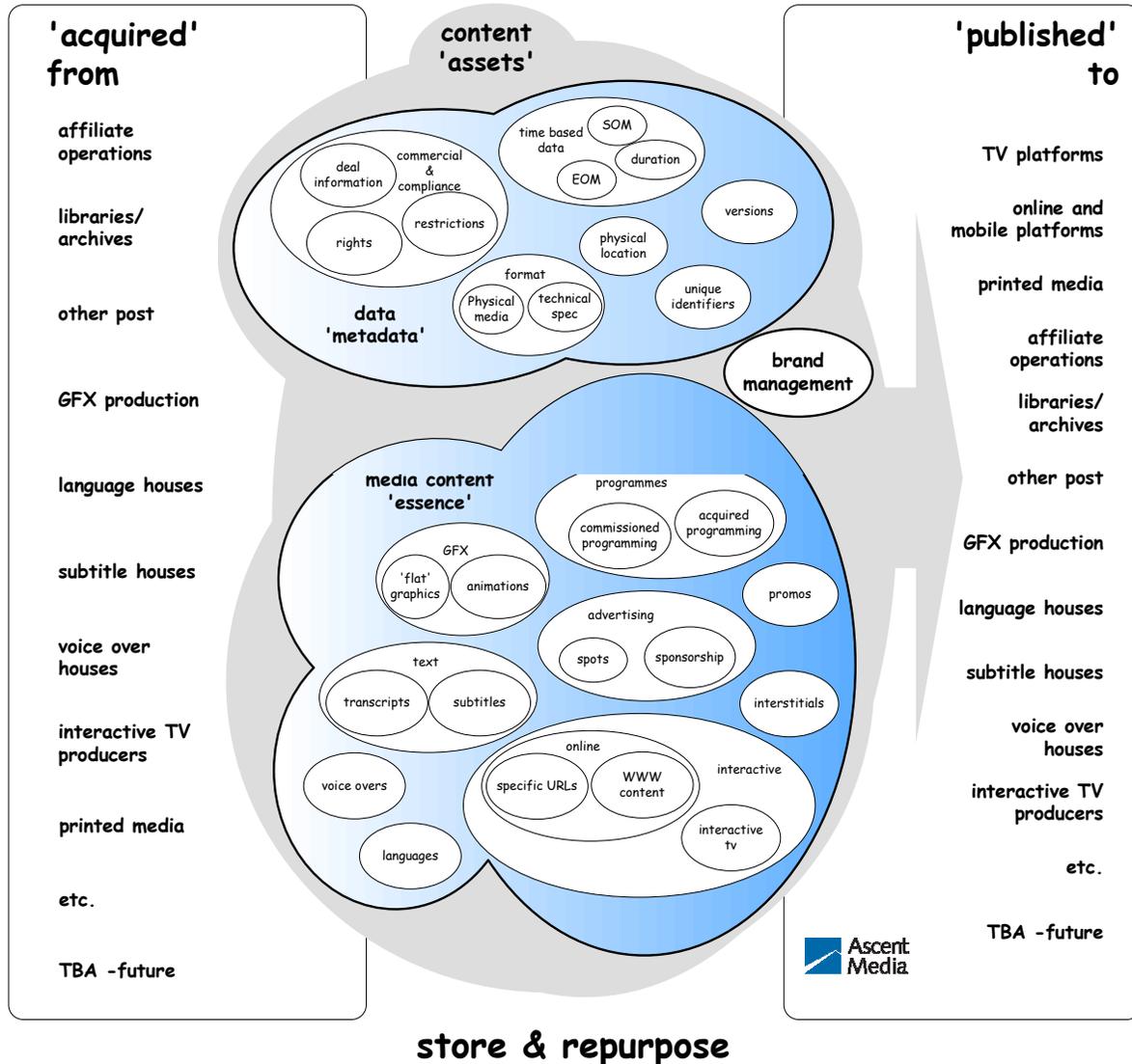
Figure 6 -- The need to integrate the world of the CIO and CTO. Source: Adapted from framework by Mike Spinks, Ascent Media Group. Used by permission for illustrative purposes only.



The centerpiece of a Digital Supply Chain strategy is the effective management and exploitation of the media assets themselves. Content-centric organizations using shared services platforms to acquire media from multiple sources and deliver it to an expanding universe of platforms and users will require a critical reassessment of the MAM strategy and possible constraints by rights owners.

- What rights are owned and by whom?
- Which rights will have been licensed and at what price?
- Are there hidden jewels?
- What can we sell and where?
- Which (digital) assets can be exploited better?
- How can rights be protected?
- How can we use DAM to streamline workflow?

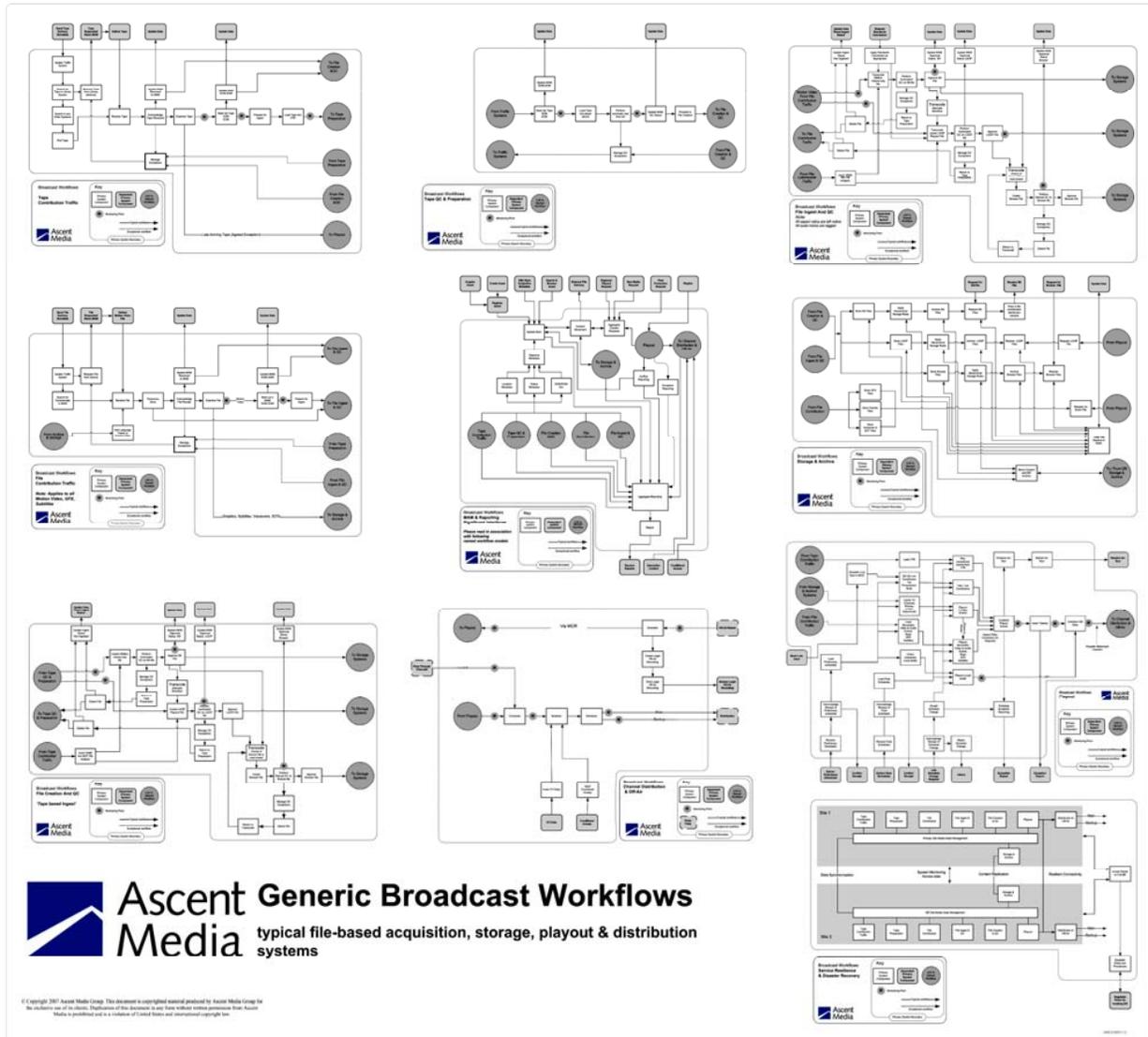
Figure - 7. The critical role of the MAM strategy in M&E SCM. Image Source: Ascent Media Group. Used for illustrative purposes only.



Many of today's M&E enterprises are facing a state of significant change as they grapple with the business imperative to migrate to content-centric environments. Such infrastructures and processes hold the promise of maximizing revenues while minimizing costs by leveraging media and rights across multiple services and platforms in a streamlined operation. However, there are deep-rooted business strategy, workflow, and change management issues that must be understood to take full advantage of digital facilities, digital workflows, and emerging content delivery platforms. Changes in business processes are accompanied by the need to redesign and optimize workflows, which can be a complex, yet critically important step before trying to apply technology to a problem.

The example below represents a series of departments within a broadcast company. *(For the purposes of this paper, it is not important to be able to actually read the detail in the boxes; getting a visual sense of the amount of work that needs to be done is sufficient.)*

Figure 7 -- Example high-level Broadcast workflow diagram. Source: Ascent Media Group. Used by permission for illustrative purposes only.



Addressing these business strategy, workflow, and change management issues is a prerequisite to taking full advantage of digital facilities, digital workflows, and emerging content delivery platforms. CIOs and CTOs need to ensure clear alignment between the technology strategy and the overall company's business strategy. They can jointly focus, not just on efficiency and cost reduction, but also on the power of technology as an enabling force for new businesses, new markets, new revenue streams, and organizational transformation. Further alignment between the CIOs and CTOs with the core business allows them to become the valued business partners of their CEOs.

As M&E CIOs and CTOs look to SCM projects, they must also consider the potential efficiency/cost advantages and operational/security risks associated with outsourcing certain tasks to Cloud-Based

service providers.<sup>3</sup> A Cloud-Based value chain would entail media companies using “Cloud Computing” -- a hosted shared-services utility that provides computational and media management services on-demand or as part of an authorized inter-domain workflow to: convert CapEx to OpEx, lower operations costs, and allow each company in the supply chain to concentrate its resources on its core mission. M&E-tuned on-demand services might include:

- Private ecosystem workflow management
- Petascale content storage
- Metadata extraction
- Format conversion
- Content repurposing and translation
- Rights clearance
- Content packaging
- Demand smoothing through edge-server delivery.

The goal of SCM is greater visibility in the operations across the entire supply chain to optimize materials ordering, better inventory management, and improved demand projections. For example, suppliers would not have to guess how many raw materials to order (ex: GM's parts suppliers); manufacturers would not have to order more than they need from suppliers to hedge demand (ex: Intel, Motorola); and retailers would have fewer empty shelves if they shared the information they had about sales of a manufacturer's product to improve demand predictions (ex: Walmart sharing data with P&G). But, as one who used to work in the consumer products industry, I can attest that the biggest inhibitor to cross-industry SCM was the initial distrust and the need to control proprietary sales data. As Thomas Wailgum and Ben Worthen caution us, “SCM is more than a technical issue -- Distrust, aversion to data sharing, and lack of coordination within industries make it difficult.” Likewise, when I first started working with the Post Production industry, I was told that the main business rule was -- Cost, quality, or time. Pick two! In essence, I was told that it was impossible to optimize all three parameters of cost, quality, and time largely because all the post houses were hedging their schedules and their time-based pricing models, because the major studios did not have visibility into their creative post processes.

When considering outsourcing aspects of operations, CIOs need to evaluate how easy and/or willing they are to share (or get) the information from the adjacent business partner(s) in the supply chain under two conditions: (1) if the partner is in-house, and (2) if the partner is a cloud-based service provider. They need to assess the level of ease or complexity in sharing this information and then consider what conditions, policies, or processes need to be in place to make doing business with the cloud-based partner as easy (or easier) than doing business with in-house departments.

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<sup>3</sup> Cloud-Based SCM would depend upon:

- Infrastructure as a Service (IaaS) -- Pooled and virtualized storage, switches, routers, and compute capabilities as standardized network services.
- Platform as a Service (PaaS) -- A service-based development environment, sometimes specialized around a particular area, such as content management.
- Software as a Service (SaaS) -- A single instance of the software running on the provider's infrastructure and serving multiple client organizations.

Table 2 -- Example Issue Analysis Framework.

Impact Analysis Workshop -- Digital Supply Chain Management Media Management Example				
Group: ___Content Creation; ___X_Media Management; ___Distribution; ___Consumption				
		Degree of Ease or Difficulty	Degree of Ease or Difficulty	Condition, Policies, or Processes Needed
Interfacing Group	Information to be Shared	In-House Facility/Group Rate 1-10 Easy=1, Difficult=10	Cloud-Based Facility/Group Rate 1-10 Easy=1, Difficult=10	To Equalize In-House and Cloud-Based
Content Creation	1. Content Metadata 2. Transcoding Policies 3. Preservation Standards 4. Rights Management Rules 5. Submitter Authorization Credentials 6. Submission Request to Archive	2	8	1. Identity Management 2. Highly-secure network:VPN, encryption, checksum audit 3. Job tracking w/audit trail 4. Secure content portal 5. Essence browse 6. MPAA audit
Media Management (Encoding, QC, Archive, Transcoding)	1. Provision Storage 2. Version Control 3. Watermark, Fingerprint, DRM 4. QC Results 5. Validation & Acceptance 6. Catalog & Proxies 7. Content Portal 8. Billing & Invoicing	NA	NA	NA
Distribution	1. Distributor Authorization Credentials 2. Search, Browse 3. Rights Acceptance Confirmation 4. Distribution Request	2	6	1. Identity Management 2. Highly-secure network:VPN, encryption, checksum audit 3. Order tracking w/audit trail 4. Delivery receipt w/audit trail 5. Secure content portal
Consumption (incl. Devices and Consumers)				

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Using the above framework as an example, we might assume that we are in the Media Management function of a major studio. We might need to receive the following from the Content Creation group in order to receive material into the archive:

- Content Metadata
- Transcoding Selections
- Preservation Standards
- Rights Management Rules
- Submitter Authorization Credentials
- Submitter Request to Archive

We might also need to provide the Content group the following information, verification, and services:

- Provision of Storage
- Version Control
- Watermark, Fingerprint, DRM
- QC Results
- Validation & Acceptance
- Catalog & Proxy Access
- Content Portal
- Invoice for Services

Likewise, the Media Management group needs to receive the following information from authorized Distributors of the Content:

- Distributor Authorization Credentials
- Rights Acceptance Confirmation
- Distribution Request

We might then have to provide the Distributor with the Content in a particular format, plus:

- Content Portal
- Catalog & Proxy Access
- Search & Browse Capability
- Delivery Receipt
- Perhaps an Invoice (for services or for content)

There will likely be different degrees of comfort and/or difficulty between the cases of insourcing versus outsourcing Media Management operations to the Cloud that require stronger policies and controls in the outsourcing case. These might include, but not be limited to:

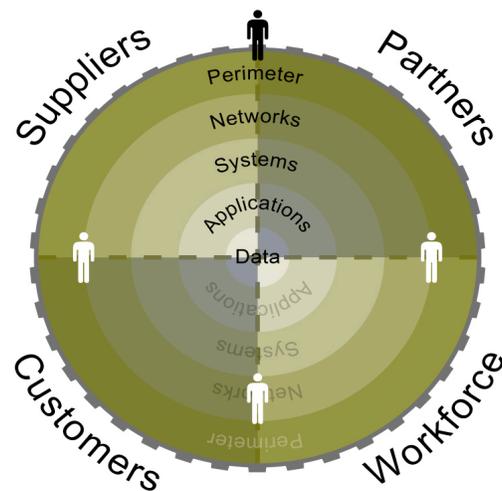
- Identity Management Systems
- Highly-Secure Network (including VPN, encryption, checksum audit, etc.)
- Watermarking and Fingerprinting of content
- Job Tracking with an Audit Trail
- Secure Content Portal
- Essence Browse
- Delivery Receipt with an Audit Trail
- MPAA Audits

Industrywide Digital SCM for M&E raises many issues that CIOs and CTOs need to consider, such as critical questions about the need for certain standards for interoperability and security among systems. The following are examples of issues and initiatives (or lack thereof) that seem to be hampering industrywide standardization of SCM:

- Universal identifiers that are unique and permanent across media applications, platforms, and services
- Global registry or index of media objects, devices, systems, companies, and users
- Common metadata across media types and applications
- Audit trails for the distribution of media back up through the production value-chain
- Customer Relationship Management (CRM) systems to track media usage and consumption patterns in a non-invasive, privacy-assured manner
- Owner-definable policies for authorization and access controls to media and services
- Management and enforcement of rights and associated royalties
- Forensic traceability of media leakage, rights violations, and piracy abuses.

Perhaps the most important decision CIOs and CTOs need to make regarding Digital Supply Chains, including any utilization of Cloud Services, is the balance of control and risk (as a cogent business decision) regarding: (1) what B2B partners to provide access and for what limited set of activities, and (2) how best to enable easy access to B2C portals by paying customers, while protecting the company's digital media assets from pirates and "information anarchists."

Figure 8 -- Balancing Security Needs with Business Needs. Source: PricewaterhouseCoopers ESBM Framework



As SCM systems are designed, CIOs and CTOs might also keep in mind the Critical Success Factors (CSF) of their SCM projects. Paraphrasing C.J. Wehlage of AMR Research, the CSFs for B2B SCM development include:

- Product Innovation
- Speed to Market
- Quality Management

Likewise, according to Wehlage, CSFs for B2C SCM development include:

- Speed of activation and content search
- Ease of use
- On-demand product availability
- Flexible pricing and subscription models
- Customer service

Addressing the SCM challenges also has its rewards. Consider this example shared by my friend and colleague Tom O'Hanian, Academy and Emmy Award Winner, now Chief Strategy Officer of Signiant. Before implementing a digital supply management system, it took 3 days to transform and distribute the content from a highly rated network TV show to online portals for purchase. After implementing a process automation and managed content distribution system, 4 minutes after a show is broadcast, it is available for purchase.

Now that is a compelling reason to take a closer look at Digital Supply Chain Management!

## About STI

Blake White founded the Strategic Technology Institute (STI) in 1985 as an outlet to investigate the business and public policy issues raised by science and engineering. STI has evolved into a network of independent consultants and a virtual 'think tank' that investigates emerging IT developments and the business, organizational, and public policy issues raised by innovations in science and engineering. STI also provides executive-level management advisory services focused on corporate strategies, often facilitated by technology innovation, at the intersection of the Media & Entertainment (M&E) and Information Technology (IT) industries. Aligning technology roadmaps to corporate strategy, STI offers the following services:

- **Decision Support** -- Scenario planning; Competitive analysis; and Strategy development
- **Technology Assessment** -- Functional and technical specification; Conceptual systems design; Vendor assessment and selection; and Engineering ethics.
- **Program Management** -- Business development; Alliances; and Project planning.

White is an experienced Silicon Valley and Hollywood executive, responsible for P&L-based commercial operations and leading product development/marketing, IT and Media industry marketing, systems integration, strategic advisory services, and corporate development/M&A initiatives. He has held management positions in some of the world's most respected Fortune 100 companies, plus innovative start-ups and the consulting practice of a Big Four accounting firm.

In the Hollywood M&E community, White held the position of Vice President & General Manager of Ascent Media's Consulting Services organization. In this capacity, he led Ascent's offerings in strategic, business and technology consulting services to the global electronic media industry. Prior to Ascent, White was Vice President of Strategic Services at National TeleConsultants (NTC), where he led the development of the META™ SOA-based integration architecture, and he was the national team leader of Digital Media Management services for PriceWaterhouseCoopers LLP.

Over a 20 year period, he held various management positions in the Silicon Valley computer industry, including: Vice President of Major Accounts at online e-book service bureau PublishOne (a business unit of InterTrust Technologies), Vice President & General Manager of media transport company WAMINET Entertainment, Director of Entertainment Industry Professional Services, Industry Marketing, and Business Development at Silicon Graphics (SGI). At SGI, White led the team that productized the first commercially available Digital Asset Management System – *StudioCentral* – and developed SGI's media applications integration architecture – the *Silicon Studio*. These technologies were used to support SGI's development and system integration efforts for: Dreamworks SKG, during the development of its animated *Prince of Egypt* feature film; Lucasfilm in the remake of *Star Wars*; and CNN during its development of the Lo Res Browse Server for newsroom editing. He was also an early participant in the interactive TV industry, serving as Executive Director for Content Development at US West Multimedia. White was a Director in the Corporate Development organization at Apple Computer, where he provided decision support and strategic alliance management services to the Office of the CEO. He also held several product management/marketing positions in multi-platform network integration technologies at Apple, Digital Equipment Corporation (DEC), and Hewlett-Packard (HP). He began his career in Procter & Gamble's Management Systems Division.

White is a frequent speaker at entertainment industry conferences that have included: NAB, IBC, SMPTE, Digital Hollywood, Cannes Film Festival, and Broadcast South Africa. He is the author of: *The Technology Assessment Process: A Strategic Framework for Managing Technical Innovation*, published by Greenwood Press; the PricewaterhouseCoopers 2003 publication -- *A New Era for Content: Protection, Potential, and Profit in the Digital World* -- and the SMPTE Motion Imaging Journal article (April 2004) by the same name, and he was co-author of *Digital Asset Management: Process Over Product*, published in Broadcast Engineering (July 2004).

White holds BSIE, MBA, and MLA degrees from North Carolina State University, Xavier University, and Stanford University, respectively. He is a member of the Society of Motion Picture & Television Engineers (SMPTE), the Hollywood Post Alliance (HPA), the Association for Computing Machinery (ACM), and the Institute of Industrial Engineers (IIE).

**Contact:** Blake L. White, Principal  
Email: [blake@strategic-tech.org](mailto:blake@strategic-tech.org) Mobile: +1-415-519-5584  
Website: [www.strategic-tech.org](http://www.strategic-tech.org) Office & Fax: +1-510-839-6447