Digital transformation for content production houses

Leveraging hybrid cloud based solutions





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Media companies are investing heavily in migrating from the traditional to digital value chain to achieve efficiency in processes and save costs. They realize that by digitizing and managing their assets, they can gain better control of content through the script to screen processes, enable collaboration between geographically spread entities, distribute content through multiple media gateways and open up new avenues for monetization of content.

The objective of this paper is to:

- Analyze the transformation needs and challenges faced in a multiplatform, collaborative digital production environment.
- 2. Identify the imperatives for digital transformation.
- Evaluate the applicability of Integrated Hybrid Cloud solutions with their intended benefits.
- Assess implementation challenges and the service delivery models offered by vendors.

Methodology

The paper is based on interviews with productions houses, technology experts, strategic and operational heads of major studios, product vendors and extensive secondary research.

Research and analysis conducted for the paper includes:

- 1. The review of the traditional and digital content value chains to identify major challenges and transformational drivers.
- 2. Understanding the impact on operational and business models due to adoption of hybrid cloud solutions for digital transformation.



Executive summary

This whitepaper analyzes the digital transformation efforts of content production houses from the script-toscreen process. The paper emphasizes that digital transformation is imperative in the new age collaborative, multi-platform, on-demand digital environment. Digital transformation is not just a change of technology, but leads to modifications and implementation of new business and operating models. Emerging end-to-end hybrid cloud-based solutions for digital transformation have certain advantages as compared to stand-alone project management or workflow management software.

The following aspects are detailed in this paper:

- i. Collaborative content production needs, cost pressures, inefficiencies in asset tracking and management, the complexities of multi-platform distribution and the on-demand nature of businesses and changing consumer preferences are exerting pressure on traditional content value chains to evolve from old and established processes.
- ii. Traditional processes or standalone software tools for project management, asset tracking, etc., may not fully address the needs of the evolving digitized media and entertainment landscape.
- iii. Content producers and service providers are adopting collaborative solutions, which not only manage the entire production lifecycle, along with underlying assets, but also provide the tools to address the needs of a on-demand, multiplatform entertainment production houses.

- iv. Such hybrid cloud-based solutions have several advantages. They enable companies to work collaboratively across multiple geographies; improved agency, vendor or partner coordination; efficient production processes; reduced script to screen time and enhanced security, and result in significant savings at various stages of the production lifecycle.
- v. However, implementation of these solutions require considerable

business and technological expertise, since they bring about operational changes that can enhance business models. Vendors are currently offering "pay per use," complete or part ownership and service-oriented models to ease the implementation process.

vi. The Return on Investment (ROI) should be considered and a longterm roadmap should be thought through for the implementation of transformation solutions.



Trends and drivers of digital transformation

The changing nature of distribution of content, collapsing release windows, collaborative content production, emerging revenue models and challenges relating to infrastructure are driving transformation in the traditional workflow. Each step of the value chain, starting from pre-production to distribution, needs to be digitally enabled, interconnected and well-integrated to keep pace with the emerging digital media environment. The key trends and drivers of this change are summarized below:

Multi-platform distribution	Content is increasingly being consumed through multiple platforms such as mobile phones, tablets and digital TVs in multiple formats. This exerts pressure on production workflows to digitally evolve to meet multi-platform needs.
Evolving revenue models	The emergence of new revenue models (VoD, Pay per View and micropayments) necessitate changes in the production lifecycle and dynamic management of underlying content assets.
Piracy and release windows	Security of data is important during the production process to curb piracy. Additionally, shrinking release windows due to piracy demand faster time to market. Furthermore, certain processes need to be digitally transformed to reduce the time taken in production.
Licensing mechanisms	Content is now licensed on the basis of platforms, the time of viewing, portability, format, duration, etc. Every content asset needs to be tagged, "re-purposed," managed and tracked to leverage licensing revenue.
Global collaboration	Content is produced and modified by a geographically distributed work force. A digital transformed workflow enables mechanisms to collaborate effectively across the value chain.
Shared infrastructure	Third-party shared infrastructure is increasingly being used at the production, content management and distribution stages. A digitally enabled workflow effectively integrates shared and dedicated infrastructure.
Shrinking production budgets	The process content supply chain needs to be efficient to improve margins and control production budgets, are driving transformation across the value chain, to enable it to become more efficient and cost-effective.
Tracking multiple assets	Multiple devices, delivery channels, formats, etc., need to be tracked throughout their entire lifecycles. An end-to-end interconnected digital workflow is also required to track assets seamlessly.

Traditional content value chain and challenges



The changing media landscape affects each part of the value chain, challenging traditional production methods and driving changes in tools and techniques. The review of the traditional processes enables one to better appreciate the challenges and need for transformation. The content value chain can be broken down into four phases - preproduction, production, post-production and distribution. The emerging environment brings forth challenges in the way projects are managed, budgets allocated, people and talent employed, content produced or tracked, shooting coordinated, distribution is facilitated, etc. Delving deep into each phase of the content lifecycle can help us better appreciate the challenges:

i. Pre-production: In the modern context, the content producer is flooded with a multitude of scripts that need to be reviewed by a large number of people, who may be geographically distributed. A collaborative workflow is therefore needed to finalize a script, scene breakdowns, budgeting, location approvals, etc. The content producer needs to track each entity within the pre-production workflow, e.g., script development and revisions, locations, casting, etc., with role- based permission for users. Furthermore, post-production agencies are involved much earlier in the cycle to finalize VFX requirements or develop "pre-Viz" (pre-visualization) for selected sequences. In the absence of integrated digital systems, traditional processes become tedious and time-consuming. In addition, remote project management and contiguous tracking of assets necessitate transformation across people, process and technology solutions.

ii. Production: Production "rushes" and dailies need to be reviewed on a day-to-day basis to provide timely feedback and control production overruns. Content has to be uploaded from the sets for key people or agency partners to review and provide feedback to relevant crew members. Therefore, there is a need for mechanism that enables global access to dailies and makes production more efficient. Moreover, film editorial teams may want to select edits for publicity and marketing. These activities need to be watermarked from a data security standpoint. Furthermore, project management is required to constantly monitor the activities of teams. Therefore, there is a dire

need for a cost-effective solution that would enable project management in conjunction with security, costeffectiveness and faster time to market

- iii. Post-production: Many production houses face the challenge of effective communication between them and post-production agencies. It becomes difficult to provide the instant feedback of editorial decisions to the crew at a shoot location. Moreover, the information gained on the shoot needs to be compiled to enable concurrent access for multiple users. In addition, multiple post-production agencies spread across geographies are also involved in large productions. An integrated and secure assettracking and project management solution is therefore imperative for management of multiple global workflows.
- iv. Distribution: For content to be available across platforms, different formats need to be developed and content re-purposed, "transcoded" and meta-tagged. Moreover, content producers want to see realistic picture of how many downloads are taking place at any point of time across different formats and platforms. There is the need for a flexible pricing mechanism, based on demand, digital rights management and revenue shared with various parties in the value chain, etc. It is therefore imperative for distribution to be well-integrated with digital asset management, rights management frameworks and billing systems for this to be possible.

The new age digital environment cannot be managed by sporadic implementation of standalone software. It requires transformation cutting across strategy, human resources, technology and infrastructure, finance departments and operational workflows.

Digital transformation as a tool to address challenges

A holistic assessment of the business model, revenue streams and associated operational workflows is a precursor to any transformation exercise. Further implications on people, technology, partner relations and audience aggregation have to be understood. Transformation has to be approached in a phase wise and incremental manner supported by process redesign and human resource realignment. Digital solution would allow better project management, workflow management and asset management resulting in better financial and operational efficiency across various phases of the value chain:

Phase	Traditional process	Digitally transformed process		
Pre-production	 Difficulty in independent review of script by distributed stake holders 	 Allows independent review with feedback mechanism for distributed stakeholders 		
	 Lack of proper feedback mechanisms to all the stakeholders 	 Enabling faster script revisions through feedback 		
	 Difficulty in tracking multiple scripts through its lifecycle 	 Tracking and storage of multiple scripts with tagging 		
	 Transcription is serialized and constrained by access to hi-res content access 	 Transcription workflow is automatically triggered and available on server, transcribers can work concurrently and remotely on rushes. Hence better turnaround time. 		
	 Producer need to manually create story telling (string outs) 			
	 Assistant Editor manually imports transcript content and data into Avid 	 Producers can create string outs on the server and push to Assistant Editor for next steps 		
	 Assistant manually creates string outs on Avid 	 Avid compliant AXF format files available to import hi-res files and string outs, along with transcribed data in Avid 		
Production	 Dailies are sent to geographically distributed reviewers through drives resulting in slower feedback and high cost 	 Immediate feedback by the reviewers resulting in faster turn- around and cost saving 		
	 Metadata tagging to the produced footage is difficult to retain through the lifecycle of the assets 	 Metadata captured at any stage of the asset is retained and can be easily retrieved 		
	 Redundant copies of the source content for backup/archival purpose 	 Copies of source rushes are automatically made and sent for archival/backup 		
	 Manual correlation of transcript content with hi-res files 	 Transcribed data is automatically associated with hi-res rushes and searchable on the portal 		
Post production	 Sharing of assets across facilities and version management complexities 	 Centralized version management & easy sharing of asset versions across locations 		
	 Each facility works as a separate entity and unifying processes is difficult 	 Integrated production management system and business processes across facilities 		
	 Resource allocation / load balancing across facilities is slower and difficult to manage. 	 Global facilities working in a seamless manner so as to optimize resource & skills usage. 		
	 Manual push of hi-res content for post workflows of color correction & mastering workflows 	 Integrated workflow for color-correction and mastering process 		
	 Manual archive process for finished material and Avid project files 	 Automatic archival of finished material and avid project file 		
Distribution	 Distribution is completely manual 	 Integrated content distribution workflows for transmission masters to networks or any worldwide client 		
	 Does not offer flexibility in terms of consumer proposition 			
		 Services can be delivered on the basis of consumer 		

proposition like VoD, subscription based etc.

Implementation scenario 1:

Digital transformation brief:

A studio wanted to transform the way content is managed and distributed by looking at various workflows from pre production to distribution lifecycle. They also wanted to review the process flow, look at inefficiencies in the current system and address those inefficiencies using digital solutions and cloud based architecture.

Objectives:

- Develop integrated platform which connects multiple software's which hitherto were acting in silos.
- A common platform for distributed users to collaborate.
- Manage and track assets across the value chain.
- Drive production efficiency and manage costs.

How the transformation was achieved:

- The production environment was connected to cloud to manage dailies, integrated with editorial, backed by a asset management solution.
- Project management solution was envisaged which would enable collaborative workflow and project management for script, revision, scene breakdown, budgeting and production scheduling.
- Provisioning of hybrid servers, client interfaces to the post production partners aids them in seamlessly work with the production platform, additionally allowing tools to integrate into the platform for transcoding, distribution etc.
- Distribution models were developed to cater to different consumer platforms, devices and target different consumer niches.

Transformation impact:

Transformation has opened up opportunities for augmenting the business model.

- 1. Possibility of creating digital supply chain for idea, scripts, content in collaboration with talent or smaller production houses.
- 2. To leverage the asset management and create content exchange that can dynamically provide selected content for local licensing.
- 3. Develop multiplatform distribution to cater to on demand consumer needs.

Key takeaway: To achieve the objectives a cloud based transformation solution could be best suited. The make or buy decision is complex and depends on the studio's vision, strategy, financial capability etc. driving partnerships with end to end media and cloud back bone providers could help ease the pains of implementation.

Cloud platform to implement digital solutions

Digital solutions would be more beneficial if implemented through cloud based solutions. As there is rapid innovation in the media space, media companies need to focus on their core competency while adopting innovations without much of cost overheads. Cloud deployment is the most potent way to keep pace with innovation for media companies without much of time or cost burden Cloud could be deployed through various models like public, private and hybrid based. While private cloud provides data security and control, private cloud is more vulnerable. Hybrid cloud is a trade-off between the two and gives the flexibility to media companies to decide what mission critical applications need to be deployed in private cloud and what should be on private cloud.

The values that are driving cloud adoption are mentioned below:

Value	How values are driving cloud adoption?				
Cost reduction	Everyday petabytes of content is generated. Cloud can help media companies to store their data without incurring cost on upfront investment for storage space. The approximate savings could be in the range of 75-80%				
Cost saving/pay per use model	Media companies use variety of tools right from pre- production to distribution phase. Each of these tools would require license fees, while a cloud based tool can help media companies save 80-85% cost by bypassing licensing cost and adopting pay per use model				
Mobility	Cloud allows various stake holders to access content in the various phase of content lifecycle based on user rights from around the globe. For example the executive producers can have real time view how much of cost is incurred, directors can view the current status of VFX work done by vendors etc.				
Operational efficiency	Cloud enables distributed work force to collaborate effectively and concurrently for a faster turnaround and attaining operational efficiency. For example dailies can be uploaded, reviewed and commented by various stake holders at a much faster rate				
Seamless integration	Cloud allows seamless integration of legacy ERP, SCM systems of the media companies				

Implementation scenario 2:

Cloud implementation for a major TV show producer:

The company is a TV show producer producing approximately 13 shows per annum. Below given table mentions the cost that is incurred by the company for a specific TV show.

Items	Volume per show	Unit price in USD	Total price in USD	Description
Media Cost (HDD) (Storage)	88	180	15,840	All of the rushes are stored for network delivery on 2TB drives one episode per drive. The producer also keep back up drive.
Deliverables - Domestic (Infrastructure)	44	540	23,760	 (1) 45 min HDCAM Texted Protection Clone ~ \$200 each (1) 45 min HDCAM Textless Protection Clone ~ \$200 each (1) DVD with Viz ~ \$70 each (1) Clean DVD ~ \$70 each
Deliverables - International (Infrastructure)	44	540	23,760	 (1) 45 min HDCAM Texted Protection Clone ~ \$200 each (1) 45 min HDCAM Textless Protection Clone ~ \$200 each (1) DVD with Viz ~ \$70 each (1) Clean DVD ~ \$70 each
Deliverable-Canada	44	400	17,600	(1) 45 min HDCAM Texted Protection Clone ~ \$200 each
(Infrastructure)				(1) 45 min HDCAM Textless Protection Clone ~ \$200 each
Per show cost (A)			80,960	
License fee for software			41,360	Fee for a legacy solution
Man hour cost	24,000	30	720,000	Workflow solution would help in reducing manpower
Real Estate (Sq Ft)	400	36	172,800	With proxy available remotely, transcription staff can operate out of home, saving costly real estate
Per annum cost			934,160	There are 13 shows produced per annum
Per show cost (B)			71,858	
Per show cost (A+B)			152,818	

Cloud implementation has helped the show in cost saving for each of the above mentioned items.



Percentage saving for each of the cost items:

On an overall basis digital transformation could result in savings of about 51% for the TV show

Hybrid cloud architecture

To be effective in delivery of services in the content production lifecycle, the cloud solution must be developed in accordance with stringent design requirements. To meet the requirements of multiple tenants, the cloud infrastructure must have exceedingly large storage capacity. Cloud technology should deliver high efficiency, streaming, transcoding from various locations. The cloud should protect content with privacy and identity management techniques. Beyond all of these, it should have a robust disaster recovery and business continuity mechanism as mentioned earlier. Given below is generic hybrid cloud architecture for the content production value chain:



Cloud delivery models

Cloud can have various delivery models, in the form of IaaS (Infrastructure as a service), PaaS (Platform as a service) and SaaS (Software as a service). Vendors are offering multiple models such as pay per use or project based costing & management support to ease the initial implementation pangs. The various delivery models are illustrated below:

SaaS: SaaS helps companies minimize upfront costs associated with hardware and software installations. Here applications, platforms and infrastructure are outsourced; hence security is of paramount issue.

PaaS: PaaS provides media companies with digital exchange platforms where they can develop their applications. It also provides elastic infrastructure on demand to handle content traffic.

laaS: laaS helps companies to retain mission critical data in-house and provides elastic infrastructure on demand to handle traffic needs.

The content producer needs to decide on whether the delivery model needs to be developed in-house or to outsource it to a third party. The variables for this decision would be:

- Business vision of the studios
- Technology strategy
- Extent of the studio's current legacy infrastructure
- Nature of projects being executed
- Financial considerations

Content producers generally prefer variable cost-based models that can be adjusted against project costs.

	In-House Out-sourced							
	Cloud Services (Public/ Private/ Hybrid Cloud)							
Components	On-Premises (Project Management)		Infrastructure as a Service (IaaS)		Platform as a Service (PaaS)		Software as a Service (SaaS) (Pay per use etc)	
	Applications	Virtualization	Applications	Virtualization	Applications	Virtualization	Applications	Virtualization
	Data	Servers	Data	Servers	Data	Servers	Data	Servers
	Runtime	Storage	Runtime	Storage	Runtime	Storage	Runtime	Storage
	Middleware	Networking	Middleware	Networking	Middleware	Networking	Middleware	Networking
	O/S		O/S		O/S		O/S	
Description	All the services are controlled inhouse. Data balancin failover, redu- together so buys a servic having to are (in a deep te such infrastr be configure		Combining exec operating syste messaging, dat load balancing, failover, redund together so tha buys a service r having to archit (in a deep techr such infrastruct be configured a	cuting ms, storage, abases, networking, dancy, etc., t the customer rather than rect and specify hical way) how ture should ind deployed	Include security authorization, tr management, co powerful domain languages, and configuration th traditional softw	, authentication, ransaction ode execution, n specific point and click nat replaces vare languages.	All the services to third party se	are outsourced ervice provider
Co	mponents contro	olled in-house	Components co	ntrolled by Service	e Provider			



Point of view of Ramki Sankaranarayanan, CEO, Prime Focus Technologies

We spoke to Ramki Sankaranarayanan of Prime Focus Technologies. Prime Focus Technologies has developed a hybrid cloud-transformation solution that provides end-to-end workflow/ project/asset management of digital supply chains.

1. How do you see the current traditional production environment transforming, given the collaborative nature of the work and geographically distributed workforce?

Certain factors such as production budgets and time to market are

exerting pressure on the traditional production environment. This is driving transformation. A digital cloud-based environment enables production houses to transform seamlessly without having to worry about legacy systems and intensive technology-implementation exercises. Hybrid cloud has enabled the global workforce to collaborate effectively to add value to content.

2. As studios adopt different tools for project management, asset management and workflow/production flow, the intended benefits usually slip through the cracks?

The standalone project/asset/ workflow management tools available in the market do not address the digital supply chain in its entirety. These solutions act in silos, and generic cloud-based systems suffer due to "access time lag." Furthermore, they are required to make time-consuming efforts for implementation, where many intended benefits do not fructify. This is why we thought of developing a hybrid cloud-based system with near-end access and global availability, which will enable production houses to plug into an already robust platform and implement requisite solutions with minimum fuss.

 What more can be done to ensure that executive producers and studio heads gain better control of and are able to more effectively supervise projects, content assets and operational tools.

The need of the hour for executive producer and studio heads is to have a single view project/asset/workflow management tool that can track content across the digital supply chain and also save costs and time. CLEAR® Prod provides project/asset/ workflow capabilities on a single platform that is available through a hybrid cloud architecture and enables single window management of the entire lifecycle of content.

4. Would a hybrid cloud-based solution drastically alter current workflows and business models in the film and TV domains? What are the motivators and drivers of adoption of cloud-based solutions? CLEAR® Prod allows concurrent workflow, which improves efficiency and time to market. Our idea was to enhance current workflows with the abilities of hybrid cloud and provide a single integrated interface. These enhancements are not meant to be drastic alterations, but opportunities to make production more efficient, open up new revenue streams and enable enhanced models for doing business. Adoption of cloud-based solutions is driven by the needs of a distributed global work force, pressure on capex, faster internet connectivity, etc. Today, studios realize that investments in cloudbased solutions enable scalability and speed to market.

- 5. What additional benefits do you envisage in the digitally transformed workflow in terms of new revenue streams, license fees, etc.? Our model will be pay-per-use. M&E companies that wish to avail our CLEAR® Prod will not have to make upfront investments in buying solutions that are currently provided in silos. We will help them transform their capex to opex and achieve substantial savings, based on the services they use.
- 6. Will you develop capabilities for seamless integration with existing solutions or would you rely on thirdparty system integrators, etc., for the integration? What would be the time frame for

such transformations?

Our idea is not to alter existing processes drastically but enhance them. We will provide capabilities to enable integration with existing tool sets to minimize additional investments and ease the transformation process. The platform will present a single interface that cuts across project management software, asset management tools and workflow solutions. 7. Studios are looking for partners who can join them in their digital transformation initiatives. What are the kinds of commercial plans or Implementation arrangements you will offer to help studios during the implementation phase?

We want to be the strategic partners of studios. Our aim is to grow with them by understanding their current technical challenges they face and help them constantly implement the required solutions. We will work on customizing the platform according to the needs of individual studios because we understand that the way the solution is tailored can be more important than the underlying technology in itself. In addition, as mentioned earlier, ours will be a payper-use model, since this provides studios the flexibility to pay for the services they wish to avail

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