



Evolving digital delivery

The challenge of quality of experience in digital TV





Table of contents

- 1 Don't compromise quality of experience**
- 2 Understand Telco's pivotal role for content distribution**
- 4 Recognize the challenges, opportunities in digital video QoE management**
- 7 Establish a cloud media platform**
- 9 Get worldwide support**
- 10 About the authors**

The proliferation of smart devices and expectation to access rich content are driving demand by consumers who expect unconstrained access from every device in any location.

Time spent consuming online video each day will increase by 23.3 percent in 2015 and by a further 19.8 percent in 2016. An average of almost an hour a day will be spent watching online video by the end of 2016—half of it on mobile devices

Don't compromise quality of experience

Analysts predict that all TV content will be moved into the Internet, requiring a network bandwidth scaled by a factor of 30. In the last few years, the video viewing time on smart devices has seen record growth.

Year over year, share of time spent watching videos on tablets and mobile devices has increased 719 percent since Q4 2011. From Q4 2012, it's gone up 160 percent year over year.

Mobile platforms – smartphones and tablets – combined to account for 60 percent of total digital media time spent, up from 50 percent a year ago and perhaps more impressively, mobile apps accounted for more than half of all digital media time spent in May, coming in at 51 percent (Source comScore Media Matrix Multi-Platform, U.S., Feb 2013-May 2014)

Growing Internet traffic is changing the business model where revenues and traffic are uncoupled.

On the other hand, companies and subscribers alike are willing to pay for quality of experience (QoE) to stay connected with uninterrupted, high-quality service. High-audience engagement, however, comes only with a high-quality viewing experience. The evolution from standard definition to HD, 3D, and soon 4K is accelerating the need for infrastructure that will enable video and content transmission.

This means adopting specific solutions, for managed and unmanaged networks, to deliver high-quality digital TV. Right now different players are pursuing a variety of strategies to address the challenges:

- Telecommunication providers are applying the concept of customer experience management to IPTV, integrating control rooms with business intelligence and Big Data technologies.
- Over-the-top (OTT) players are simultaneously leveraging multiple content delivery networks (CDNs) to manage content flow over the Internet.
- Cloud providers are hosting CDN-like services.
- CDN providers are likely to deliver cloud-based encoding to distribution services.

Embrace a new content distribution ecosystem

Pay TV operators continue to pursue multiple CDN models as OTT video content and their own multiscreen services overtake their traditional broadcast video services. Some operators are building out their content delivery networks while others are partnering exclusively with existing CDN providers. Finally, others are investing in a hybrid model, with some partnering and discrete CDN ownership.

Worldwide spending on video delivery equipment was expected to reach \$258 million in 2013. CDNs were projected to hit \$193 million that same year. Adaptive bit rate (ABR) origin and packaging servers were expected to reach \$65 million in 2013. (Source: Infonetics Research)

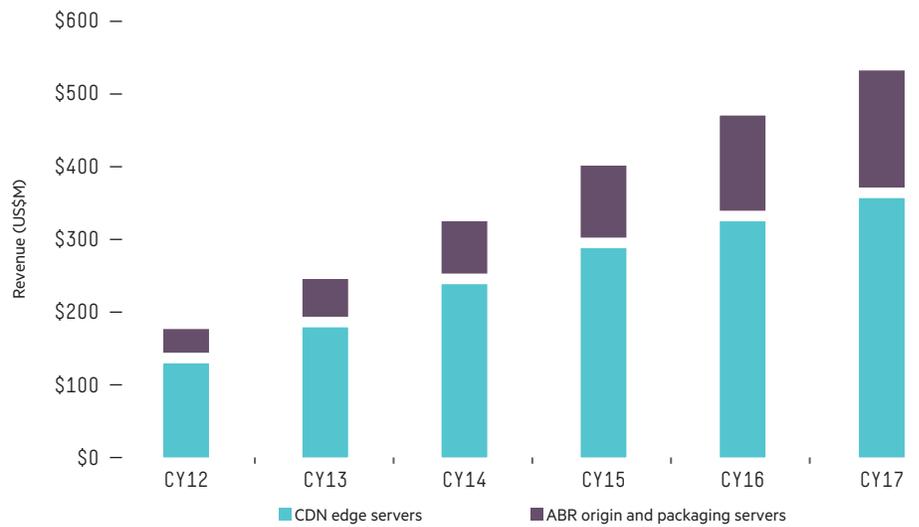


Figure 1: Video content delivery networks spending forecast

By 2017, researchers expect revenue for these platforms to increase to just over \$547 million, with the highest growth coming from origin and packaging servers. They are being used in operator networks, content delivery networks, and at studios to originate and package multiformat, streaming video content.

Video CDN equipment will grow at a 2012-2017 compound annual growth rate (CAGR) of 24 percent. CDN edge servers will grow at 21 percent CAGR, reaching \$372 million by 2017.

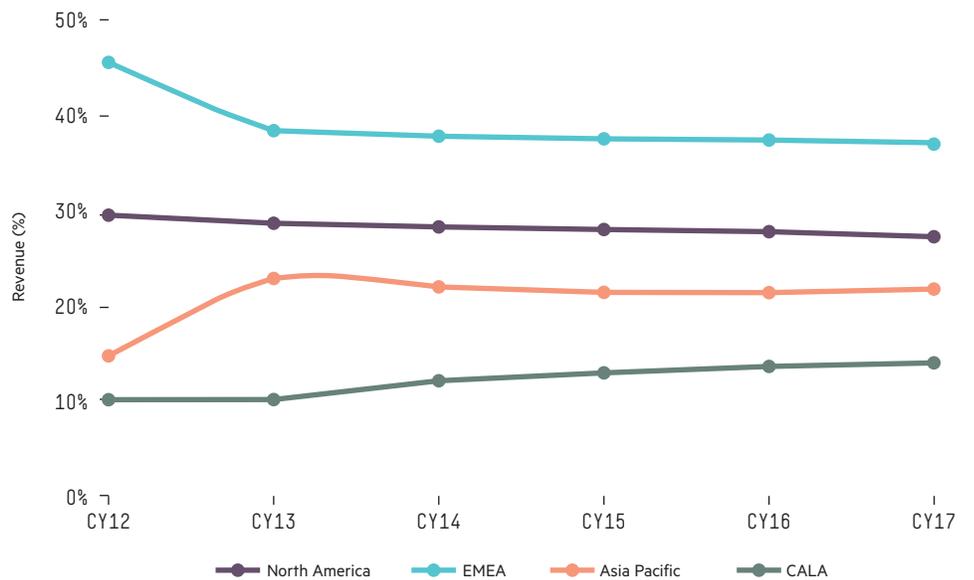


Figure 2: Video content delivery networks spending forecast by region

Understand Telco’s pivotal role for content distribution

The competition and motivation to attract customers and provide content are focused on technologies for distribution and delivery.

HPE helps media organizations:

- Transform to IT-based operations and Internet-based business
- Exploit content across multiple channels
- Generate actionable, unparalleled customer intelligence
- Enable seamless, connected user experiences
- Deliver operational efficiencies and enable more innovation

Telecommunication providers have a pivotal role in content distribution and delivery. They have to build sustainable networks, supporting the Internet and to control and efficiently manage traffic. Furthermore, Telcos need to enable content producers and consumers.

Telecommunication providers, broadcasters, OTT players, and CDN pure-play operators are all trying to establish a space for their offerings. Telecommunication providers have the advantage.

Telcos know that quality of service is more easily guaranteed on a managed network. So they are creating business-to-business services for OTT players, such as quality of service, billing and invoicing, and different content types or levels that include free vs. premium. Examples of these are alliances between Telco operators and OTT players that ensure QoE, using local distribution channels.

This enables TV companies to recapture advertising spending, which has shifted to emerging digital media platforms.

The content delivery network supports distributors' demands for high-performance delivery of rich media content. They include technology solutions for localized caching, as well as metro and regional/national overlay CDN services that enable Internet service providers (ISPs) and content providers to establish mutually beneficial commercial agreements.

- A content delivery network enables up to 30 percent reduction of traffic (on peering point this value can be higher) and an overall improvement of the QoE perceived by consumers.
- A content delivery network deployment can solve some traffic congestion Telco's experience. Some have more traffic congestion at the MAN level; others at the peering point.
- A content delivery network enables consolidation of all Telco content delivery infrastructure—such as IPTV, wholesale, OTT, and multicast— in a single content delivery network.
- It also enables a bandwidth strategy based on average rather than peak traffic volume.

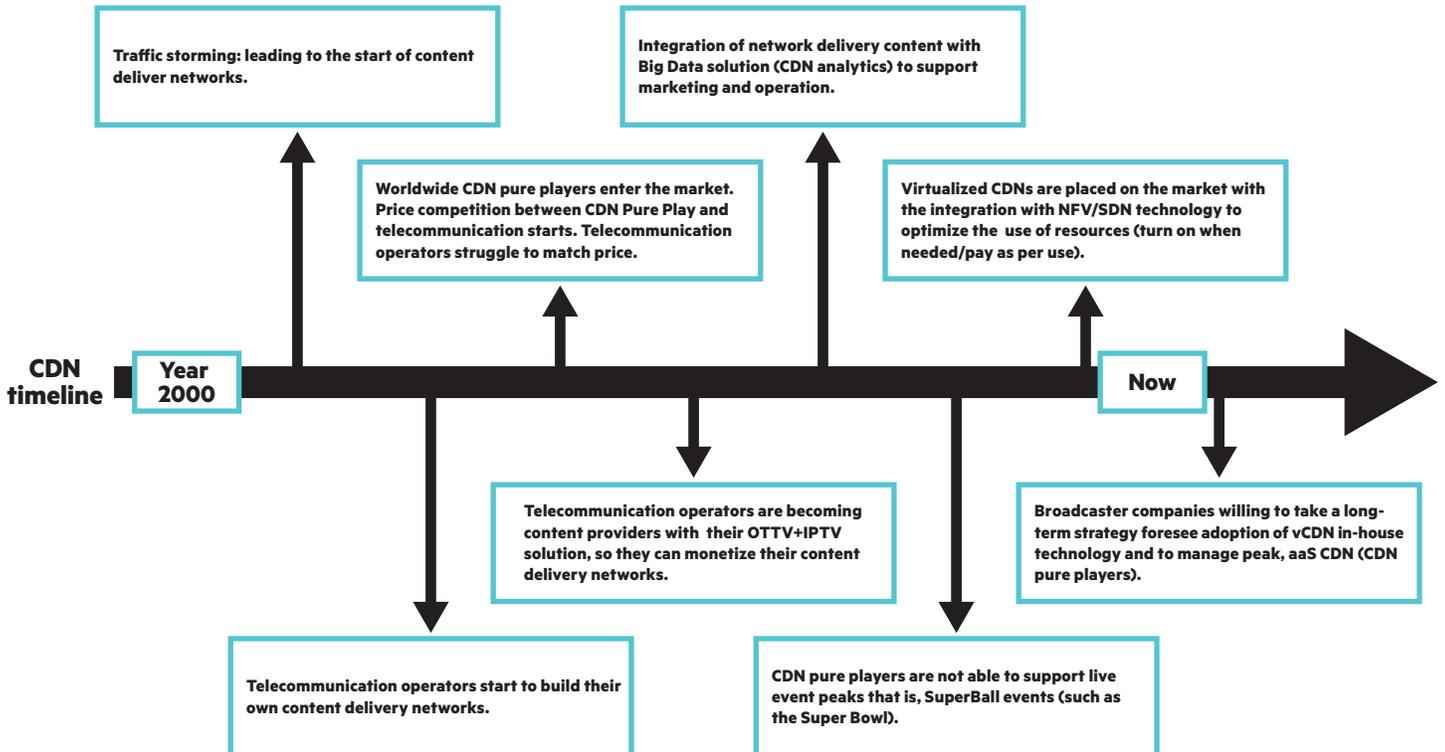


Figure 3: The evolution of content delivery networks

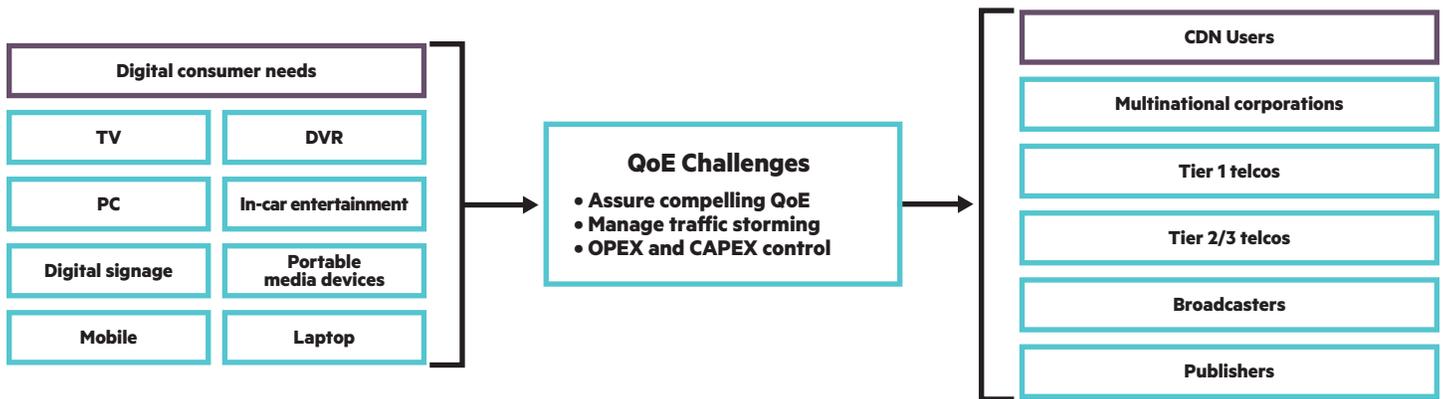


Figure 4: How CDN services can address QoE challenges

Recognize the challenges, opportunities in digital video QoE management

Managing QoE brings challenges on different levels.

Quality of Experience challenges

- Immediate or near-immediate content access, with low latency
- No lag during viewing, with adjustable bit rate
- High quality, with large bandwidth
- No distribution stops, with high system and network reliability
- Video (but not limited to) quality experience monitoring, with reporting and analytics
- Management of very large volume of traffic, with high scalability

CDN Challenges:

- Quality of Experience
- Traffic-storming
- Costs

Traffic-storming challenge

TV and Internet—Strong increase in content is leading to:

- Infinite channels and offering
- 2x HD-3D
- Network-PVR
- Second screen
- Rapid channel change
- “Everything” moving to video

This increase is impacting transport and access:

- Transport—Seeing increasing diversity in access:
 - Devices, SmartTV, PC
 - Mobile, wireless, LTE
 - Free vs. pay
 - Fiber to the home, fiber to the cabinet
 - Sustainable cost level and total cost of ownership
- Access—Growing bandwidth demand means:
 - Policy management
 - Low upgrade costs
 - Allocation of bandwidth

Cost challenge

- OPEX control, easy to maintain and manage
- CAPEX control, sustainable expansion costs
- Capacity planning, model to support forecasted needs
- Delivery strategy, agile approach to introduce and manage new technology

Opportunities realized

- When Google search queries slow down a mere 400 milliseconds, traffic drops 0.44 percent.
- 80 percent of people will click away from an Internet video if it stalls while loading.
- When car comparison pricing site Edmunds.com reduced loading time from 9 to 1.4 seconds, page views per session went up 17 percent and advertising revenue went up 3 percent.
- When Shopzilla dropped load times from 7 seconds to 2 seconds, page views went up 25 percent, and revenue increased between 7 percent and 12 percent.
- When you speed up service, people become more engaged—and when people become more engaged, they click and buy more.

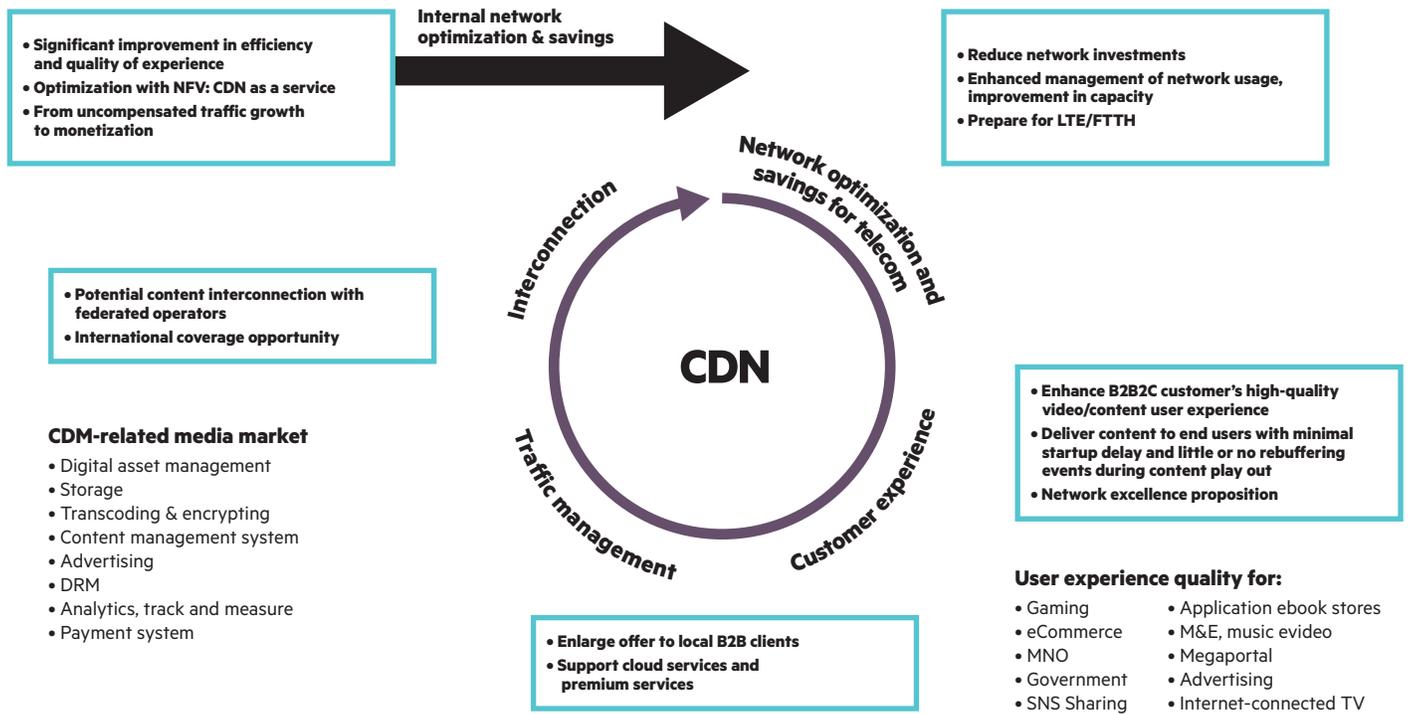


Figure 5: CDN benefits

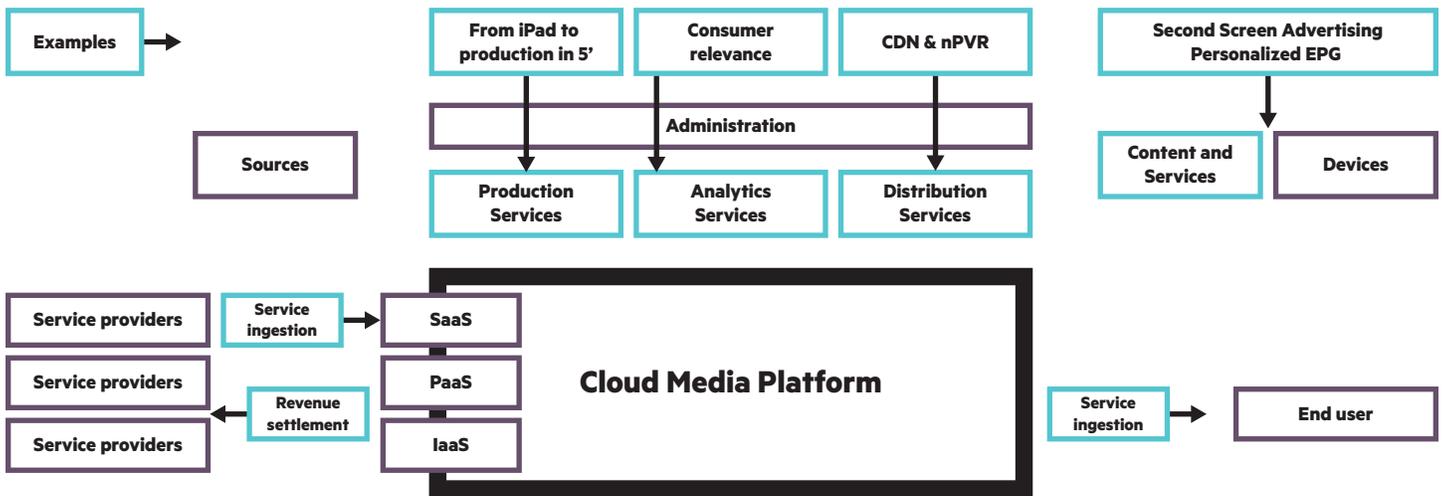


Figure 6: Cloud media platform paradigm

Establish a cloud media platform

Telcos continue to carry the traffic for OTT players— sometimes with limited returns. Efficiency and lowering costs are imperative.

The digital TV industry must leverage cloud media platforms to manage change and address future needs. Cloud media platforms accommodate all technology parameters and offers the flexibility necessary to address geographic and service expansion, such as TV Everywhere.

Using cloud platforms enable providers to share the fixed costs of equipment and development across large customer bases and drive down prices.

A cloud media platform provides an on-demand capability—from content creation and management to distribution and monitoring—enabling:

- Less complexity by leveraging cloud-based services
- Fast deployment—much faster than developing in-house
- Comprehensive and secure storage of media assets and subscriber information
- Quick and easy discovery of relevant content for operators and consumers
- A better business model—operating expenses instead of capital expenditures

This approach to content distribution is enabled by the adoption of disruptive technologies, such as network function virtualization (NFV). With it, virtual content delivery network (vCDN) can be used, with exponential growth in demand for bandwidth. Right now, the types of network functions and services that operators plan to move to are virtual provider edge (vPE) include content delivery networks and caching.

vCDN enables the dynamic deployment of end points as customer demand grows. It offers agility to quickly address issues without requiring procurement and deployment cycles. And, this approach helps balance short-term requirements with long-term policy.

Consider CDN requirements and features, such as web-caching, video optimization, routing, monitoring, and multidevice support. Consider CDN distribution strategy in the network. Also consider CDN ownership or CDN in the cloud—or even the new disruptive technology of virtual content delivery networks.

The CDN business case must be predicated on a comprehensive assessment and a proven estimation model. Look for low-hanging fruit but ensure your CDN incorporates features for future demands, can scale, and meets the obligation for quality of experience. This may even open up new markets and revenue streams.

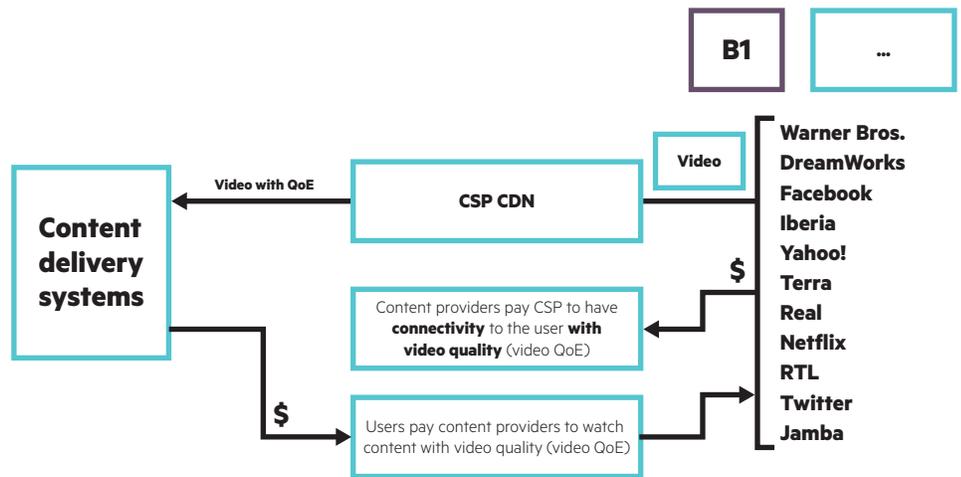


Figure 7: vCDN concept

Assumptions

- 10 year contracts/year with an average value of €~100K (for Y1 and -10 percent/year)
- Estimated a 10 percent price reduction/year on the services offered
- Cost reduction benefit valued considering GB delivered efficiency (no need to invest or buy transit)
- Reduced churn rate (cumulated)
- Capability to sell at national and international level

Revenues:

- Pure CDN delivery (national, international, interconnected CDN) for video/content, web acceleration, and digital media VAS
- Digital media services: ingestion, transcoding, optimization, DAM, storage, etc.

Potential revenues not considered:

- Up-selling/cross-selling of hosting/cloud/connectivity services
- ePayment
- Advertising platform
- Other VAS

Get worldwide support

Hewlett Packard Enterprise is a global, proven technology solutions provider, offering IT infrastructure and global services and user devices. We invent, engineer, and deliver technology solutions that drive business value, create social value, and improve the lives of customers.

Specifically, we help media organizations:

- Transform to IT-based operations and Internet-based business
- Exploit content across multiple channels
- Generate actionable, unparalleled customer intelligence
- Enable seamless, connected user experiences
- Deliver operational efficiencies and enable more innovation

HPE Digital TV Framework provides a modular solution to manage innovative business models and deliver digital TV services efficiently. It's part of a common foundation that shows areas, modules, and components that compose the digital TV context. And the framework facilitates the interoperability between broadcasters, OTT players, and content producers.

HPE Industry Advisory Program is a part of our Solution Consulting Services that delivers innovative thought leadership to address our clients' key business issues. It's built on the global knowledge, expertise, and experience of our industry business consultants. The program incorporates proven HPE methodologies, industry frameworks, and intellectual capital to deliver business value through a collaborative, social media-based environment.

Learn more at

hp.com/go/me

hp.com/go/scs

About the authors

Alessandro Puglia

Alessandro Puglia has 10 years of consulting and industry experience, helping clients improve their performance by addressing strategic and operational issues. In his career, Puglia served top players across communication and media industry as a business consultant, applying advanced subject-matter knowledge in complex business issues, and identifying and executing their IT strategies.

Alberto Curcio

Alberto Curcio is a solution-oriented professional with a business, technical, and communication background. Curcio has extensive experience in business process modeling and adoption of communication and media industry frameworks. He has a special interest in the digital television technologies, and his activities include coordination of thought leadership initiatives.



Sign up for updates

★ Rate this document