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Video For all Seasons - Mobile Video, Web Video and TV Broadcasting

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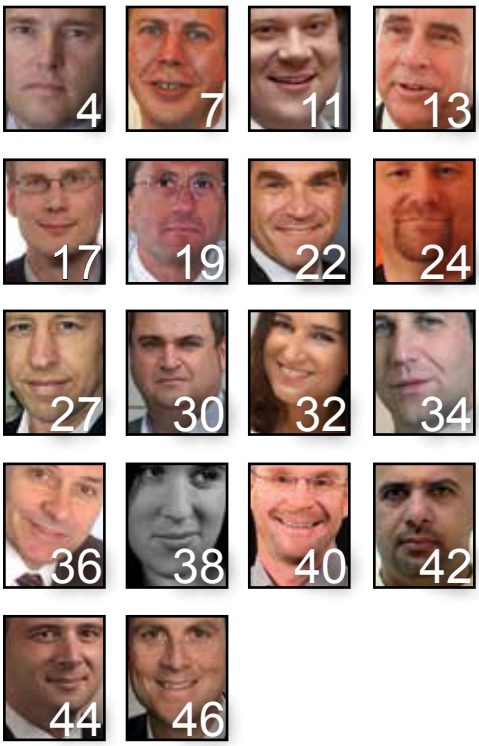

Connections

This edition looks at "Video for all seasons" - charting the progress of video capability against rising demand. Video is versatile - it is a tool for moment-capture, a training aid, entertainment, news or business remote conferencing. It is coming of age with enhanced technology, but is also undergoing a major disruption!

Internet IPTV is Marching on: TV distribution is entering a major disruption stage, after the significant success of some OTTs such as Netflix and the launching of GoogleTV and AppleTV last year. Consumers have now broken out of the Telco walled garden and even employees now demand no less whilst at work. This is accompanied by changing viewing patterns, towards long-form video on PCs, augmented video content on mobile devices and integrated Social TV apps.

The experience of the music industry serves as a dire warning - this cannot be ignored, yet the genie will not go back into the bottle. The great hope for carriers is that the old adage of "content availability trumps quality" is not going to last beyond the first wave of early adopters. What should come next is the establishment of quality video delivery - for a fee - that users can rely on, with the transition from cost-for-bandwidth to cost-per-content.

Social Media TV Apps - Even Bigger than Content: To monetise while staying competitive in a crowded OTT market with remarkable low entry barriers, where VoD titles are becoming a commodity, Telcos must find compelling features to differentiate their offerings. Many in the industry now realise that social networks are the gateway to the consumer. A Social Program Guide is an example of TV app, combining TV with social media. TV apps satisfy the need for 'campfire behaviour', sharing viewing experience. Their potential is high: they are associated with longer user attention and with deeper pockets reserved for consumer entertainment.

Content Providers and Telco Must Collaborate: With Social TV comes greater demand for any-screen, now made easy by Cloud distribution. Video-anywhere challenges operators with issues of security, scalability and compatibility with the rapidly launched ever-smarter devices, but Telcos are best placed to overcome these issues. The 'best-effort' CDNs cannot cope with premium video delivery and need to find ways to monetise the service, so they need to collaborate with network providers. On the other hand, Telcos are lagging behind Internet players with their social apps and must encourage innovation to retain consumers.

Big Game - Big Data - New Behaviour: Internet TV brings significant change in consumers' behaviour. To target service packages and advertising, audience segmentation must consider not the traditional demographics and age groups, but the mode of viewing: on demand, non-linear, on mobiles or via social media. Mobile video has a unique ability to engage with consumers, convey messages succinctly and stimulate responses. It is particularly effective, even viral, in spreading the message. Video produces 'Big Data' - in Volumes, Variety and Velocity. Big Data needs big BI (*Business Intelligence*) analysis, which holds the key to effective monetisation.

Video Enhanced Enterprise Business: Video can save significant business costs and yield productivity gains, but much more than that - it changes how business is conducted. Many enterprises are becoming media companies, generating their own content and addressing customers directly, especially in health services and education. Particularly effective is the simultaneous supplementary business information - associated descriptions, comments and maps. The enterprise can utilise the best of consumer technology but it also needs to address security and privacy issues on any device, manage content rights and utilise internal processes and workflows.

Technology to Sustain Demanding Video

Video was held back for years due to inadequate delivery technologies. Now TV sets have WiFi and Internet and Video-as-a-Service (*VaaS*) is served from the Cloud. Android promises to be the next Linux of Pay-TV world, with its wide developer community and its open any-device platform. However, more development is needed to adjust Android for broadcasting media, interfacing with TV controls and the MIPS chips that are commonplace in the TV-world.

Good news for Telcos comes from the OptiBand project, reporting a long-awaited technology breakthrough: delivery of multiple streams of high quality over a single DSL line, thus providing several HD channels per household. Telcos can now offer the existing DSL pipe for the delivery of IPTV!

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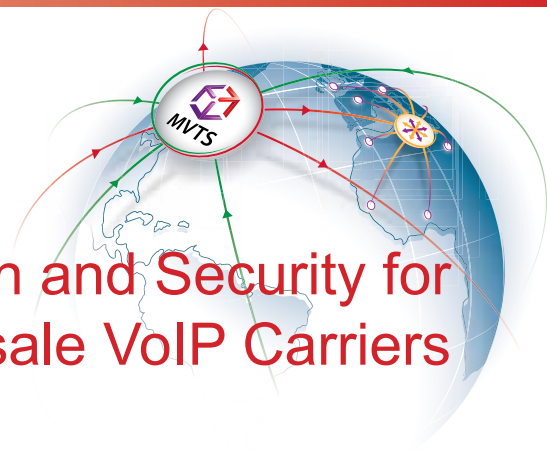


Profit Protection and Security for Wholesale VoIP Carriers

The VoIP wholesale market is developing fast and has expanded in size greatly over the last years. ALOE Systems is a VoIP network software vendor that has been in the market for over 10 years. How is ALOE Systems different from other vendors? The company has rich experience of customizing products to meet the needs of a particular carrier; however, the key advantage of ALOE Systems is the company's unique know-how - Profit Protection. With this feature carriers can route traffic literally in any way they want, assuring set profit margins.

MVTS II is a four-in-one platform for running VoIP wholesale business, combining switching, routing, billing, and border-control functionality. 2011 saw a significant increase in performance of MVTS II - the concurrent calls' rate rose to 150 000, along with the CPS rate. The system fully meets the demands of large-scale carriers, being capable of routing large amounts of traffic.

MVTS II is one of the most efficient softswitches in the market: the concurrent calls rate is 150 000.

MVTS II Key Features

- The Profit Protection feature allows the carrier to create a set of routing algorithms for customers with different needs in traffic handling/transit. The carrier can set routing algorithms-based on
  - » Route cost (LCR)
  - » Route quality (ASR, ACD, ABR, PDD)
  - » Time (time of day, month, year, day of the week)
  - » Gateway load
  - » Local Number Portability (LNP)
- Maximum difference between incoming and outgoing calls is established to assure profit margins
- Powerful switching: MVTS II is a tool for effective protocol interworking (SIP-H.323 two-way conversion) and transcoding with a wide range of codecs supported
- Partitioning capabilities allow creation of hosted softswitches within the main platform. With partitions being fully independent, carriers can benefit from renting the switch to other providers. For start-ups, MVTS II is a cost-effective way to enter the VoIP wholesale market
- Route quality control - if route quality falls below a certain point, the route can be blocked and reconfigured to guarantee SLA parameters to end clients
- Distributed modular architecture of the system allows easy scalability of the system and its overall flexibility along with high levels of fault tolerance and network redundancy
- Integrated prepaid/postpaid billing helps the carriers manage finances more efficiently

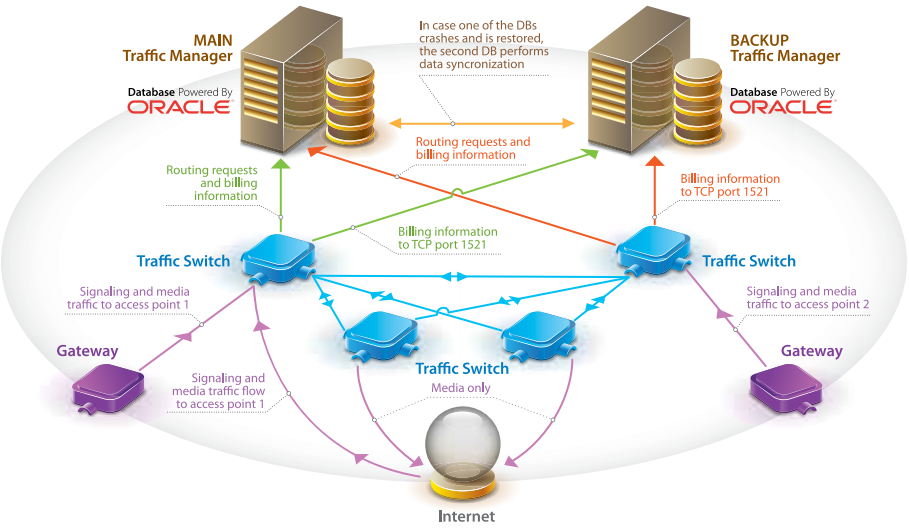
ALOE Systems' other products are ALOE Transit SBC and MVTS Pro.

ALOE Transit SBC is a session border controller that combines security, media management, and transcoding services in a single, highly scalable software platform.

The product can be easily deployed in complex network structures and features network topology hiding and distributed architecture, which makes the network less vulnerable to malicious attacks.

ALOE Transit SBC Key Features

- Secure entry point into the carrier's VoIP network
  - » Call authorization by IP addresses/usernames from system configuration data
  - » Control of incoming CPS/RPS value
  - » Privacy support (presentation/screening indicators, RFC3325/ RFC4497/Cisco Remote-Party-id)
- Network topology hiding
- Centralized media traffic management
- Media anchoring
- Protocol interworking
- Transcoding



MVTS Pro is a high-performance class 4 softswitch featuring high capacity, support of a variety of VoIP protocols, and RADIUS for interaction with external billing systems.

Learn more at www.aloe-systems.com.

Get on board - the transformation of an industry is well underway

by Geir Bryn-Jensen, CEO, Nevion

The Internet as a medium for distribution of television services has made its debut but this is a major disruption of the existing landscape, with its deterministic switched networks, point-to-point mind-set and pre-determined schedules. The troubles of the music industry serve as a dire warning but "content availability trumps quality", at least for the early adopters. Many in the industry now realise that content and social networks are the gateway to the consumer. The Cloud enables numerous individuals and organisations to generate, store and consume at the same time, effectively levelling the playing field. However, providing end-to-end solutions with effective content management will win the day - the fragmented value chain will disappear, while business will transition from cost-for-bandwidth to cost-per-content.

Geir Bryn-Jensen is CEO of Nevion. He brings nearly 20 years' experience in international sales and business development within the telecom, broadcast and IT industries.

Before joining Nevion in 2010 as executive vice president of sales, Mr Bryn-Jensen spent six years as managing director/country manager at CA Norway AS (Computer Associates). Prior to this, he was a manager at Accenture's Media & Entertainment practice in Norway, following six years at Telenor in various business development roles.

Geir Bryn-Jensen has an MBA in Strategic Management from the Norwegian School of Business Administration (NHH) in Bergen and a Bachelor of Science in Communication Engineering from the University of Kent.

It seems clear that the broadcast and television industry as we know it is undergoing a dramatic transformation. We have already seen a disruptive change in video and content consumption with an increasing number of connected devices and new providers of video and media content. This is not the first time that a sweeping change has affected the industry, but when complete, it may well be the most far reaching. This time the whole industry is impacted by a paradigm shift, and with change comes opportunity…and threats if you're not prepared.

The industry has already experienced a shift to Internet Protocol (*IP*) for the distribution of television services. In fact, this trend started back in the mid-1990s, but the consumer experience didn't really change until the market was exposed to new sources of content in 2000-2010. When the next generation of connected devices was launched toward the end of the decade, changes in consumer behaviour accelerated. It is fair to say that now we are experiencing a paradigm shift in the consumption of video and media.

Two of the key 'million-dollar' questions are: 1) how will this impact the rest of the established television industry and 2) how prepared are established players to embrace this momentous shift.

Adapting proven IT business practices and disciplines and deploying IP technologies for video and media is the new name-of-the-game. It will eventually evolve from how content is packaged to how transport is managed. The traditional economic mechanisms in the television industry are under pressure and the marketplace must manage a transition from value-chain to value-network business models.

Technology is no longer a barrier to acceptance of a landscape dominated by IP. Other market drivers are at work-some transparent, others less so. It makes sense that the big names in today's established market must be prodded to adopt IP as a business-enabling protocol as it represents a major shift away from the comfort of completely deterministic switched networks. Years of development and investment in infrastructure and hardware are not made obsolete, but the emerging networking technology provides an opportunity to manage both, and harvest more value from past investments. Departing from a point-to-point mind-set to a world of non-physical connections is not easy. Losing apparent workflow control is uncomfortable at best for many broadcasters, content providers and service providers. Introducing IP for the transport and management of live video flies in the face of tried and tested linear broadcast systems. Packet technology

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entails chopping signals into fragments and transporting them over an IP network with a loss of all perceived control-considered a heresy in the early days of IP's emergence on the professional broadcast scene.

A climate of IP fear continues

Concerns over quality and security loom large. Recent struggles of the music industry with piracy and privacy issues serve as a potent reminder of the dangers. However, IP as a protocol and the technologies surrounding it have matured. For all of its clear benefits, IP is not a physical medium. It needs technology to control security, latency and quality-perhaps the three most significant elements of professional broadcasting. This is where the often-spoken-of network and service management system must, or should, not only control, monitor and manage network operations but also bring built-in intelligence to provide critical functions such as media service control, bandwidth optimization, and advanced path-finding.

The fear of IP still pervasive in the professional broadcast realm is both unnecessary and unfortunate. By deploying proven IT business practices for service and network management, IP can provide tremendous value to the professional broadcast industry. When properly managed, proven IT practices and technologies can be much more efficient, optimize many aspects of an operation-from physical resources to bandwidth-relieve financial burdens, and enable management of capital expenditures. At the same time, IP networks can provide significant value-added services, including social media capabilities, which grow in significance by leaps and bounds in all aspects of media and communications.

New market drivers

For decades, the broadcast industry has developed advanced standards for the traditional value chain that are very industry specific and remain far outside the realm of the consumer. Now we are seeing a threat by substitution of these standards, and new market mechanisms evolve. As IP evolves in the professional realm, there are market forces at work that are greatly affecting development. First, consumer technology has evolved to the point that it is now driving the market. The range of connected devices now available-at price points that make them nearly ubiquitous in the marketplace-have transformed the way that media is consumed. Users can, and now urgently demand, to access their content anywhere and at any time. Expectations in terms of mobility and content quality are vastly different now than they were ten or even five years ago. The ability-or perhaps most accurately the right-to consume media on a chosen device is forcing the industry to convert to a more IT-focused environment.

Looking way down the value chain, one only has to observe the cable head end where coaxial cable once dominated. Further up the chain, you encounter more fibre, visible Ethernet and IP connections. There is the simply a massive catch up as the industry sees that IP and content are the gateway to the consumer. The pressure is high. While some providers are already on their way, we are at the outset of a period of true convergence of legacy systems with IP/IT broadcast technologies and business practices for broadcast.

A few short years ago, most of us would never have predicted the overwhelming growth of consumption of new services as we are now experiencing. The assertion remained that over-the-top services didn't deliver the needed quality. True enough. However, many underestimated the desire of consumers to access content, and that "content availability trumps quality" - initially at least. Expectations have grown as consumers have come to expect live streaming video on their devices at nearly the same quality levels as the traditional experience of sitting in front of their televisions.

The laws of technology

Moore's Law - named for the exponential growth in computing technologies whereby processing speed, memory capacity and other computing capabilities improve at ever-expanding rates - comes to mind. Moore saw it as the driving force of technological and social change. It is not difficult to extrapolate this to today. As this exponential growth continues, certain facts are clear. With all of the benefits that IP and IT best practices enable, there are complexities that must be managed: improved network utilization with compression and managed quality are two.

IP transport must be smartly managed in a way that maximizes all its benefits and minimizes its inherent risks. An integrated management platform can and should optimize bandwidth through advanced path finding. A smart management system should proactively track quality to predefined standards, monitor and manage all network components in real time and enable network configuration, maintenance, troubleshooting and problem resolution from a simple interface. Properly managed IP transport will reduce costs. When this is fully realized, there will be a shake out of industry leaders. New players will replace the old. New markets will emerge. In television, content development will be a market unto itself. Those who innovate to these new market dynamics will lead us down new paths.

A value network emerges

At the end of this process, the TV value chain will merge into a media value network encompassing new business models and market rules. Traditional players who have not already done so will need to reinvent themselves. It seems inevitable that this transformation will be highly visible, with clear winners and new dominant players in the marketplace.

The future looks bright for companies who provide the technology to enable and empower consumers. Those who offer it all, from production through to the consumer, will have a tremendous advantage. The days of a fragmented value chain are rapidly disappearing. We are moving away from the old paradigm of a process-driven chain, where one step leads to the next in a complete process. The Internet industry operates differently, where now a huge cloud exists at its centre, enabling wide-ranging individuals as well as companies to operate, effectively levelling the playing field. When content is put into the cloud for transport and sharing, the need for management, from ingest to distribution, is imperative to ensure quality and security.

Playing out the future now

We are moving to a reality where consumers demand any content anywhere, anytime and in any format they choose. Well-established market barriers and protectionism persist. Legislation and political issues are playing out now and demonstrate the push and pull of opposing market positions. The very open nature of the Internet is pitted against those who understandably want to be its gatekeepers, controlling the content that goes through what has become essentially a very large pipe. Network neutrality will be achieved as we transition from cost-for-bandwidth to cost-per-content business models. While the exact timing is yet to be determined, the march to a future dominated by IP is upon us. The technology for safe, high-quality, cost-effective IP transport is here now. ●

Can IPTV continue to drive Internet demand?

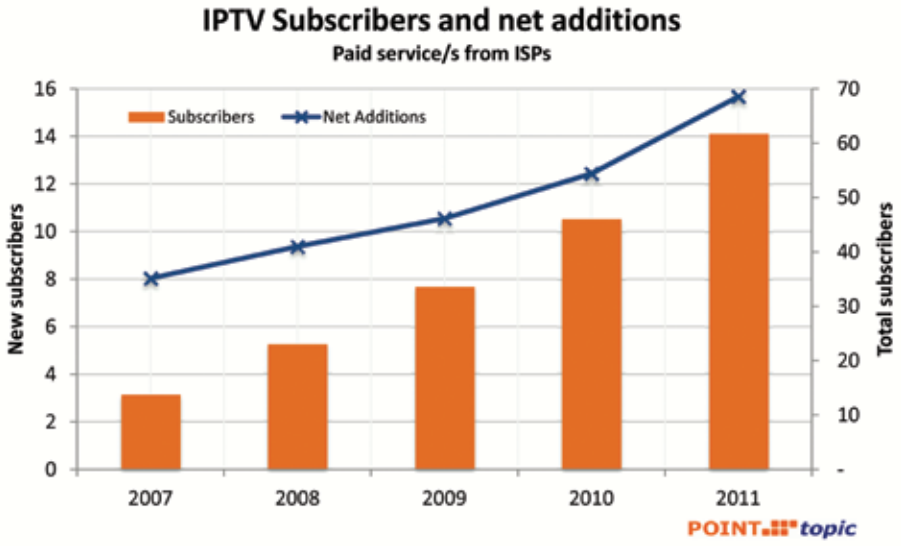
by Oliver Johnson, CEO, Point Topic

IPTV on the Internet is enjoying patchy success. It is not easy to deploy, it is met with legal resistance, it suffers from fierce competition and the margins are not sufficient. Before it reaches the mass market, several hurdles must be overcome: the bandwidth is often not high enough, coverage is incomplete and legislation may not enforce 'net neutrality'. However, the non-internet pay-TV market is perceptively losing ground to Internet TV and must find new business models that can persist. Turning Internet-TV into a mass-market proposition can still bring revenues, as is the case for online Music, but the reliance on advertising may not be sustainable, as seen with the transformation of magazines into online versions.

Oliver Johnson is the CEO of Point Topic. Mr Johnson joined global broadband analyst firm, Point Topic, in 2003 and is today responsible for driving the company forward. Since joining the organisation, he has spearheaded the development of the content of Point Topic's web services into an internationally recognised information source for broadband. The company's mission is to provide focused information on broadband communication services and as CEO, Mr Johnson is responsible for providing subscribers with updated online resources for worldwide broadband statistics.

After leaving the University of London with a BSc in Maths and Economics and prior to joining Point Topic, Mr Johnson worked with a range of organisations in senior marketing and multimedia roles. This included the role of Online Marketing Manager at image100, Senior Producer at Clever Media, Producer at Redwood New Media and Webmaster for Ovum. With over twenty years' experience in marketing and developing online environments and being involved in ground-breaking internet implementations, Oliver Johnson has a wealth of knowledge in this industry.

Video in one form or another has been a driver for internet development since the 1970's and it is still the current star driver for higher bandwidth. Today, when most consultants and analysts are asked 'What application will drive the need for a 100Mbps broadband subscription', there might be some careful, thoughtful consideration but the first words will be something to do with video. It won't be the only factor but today it is the primary reason consumers will elect to upgrade their connection and subscribe to (or watch for free) one or more variants of the multitude of video delivery services on offer. This means, in this phase of the world internet market where revenue growth from plain access subscriptions is slowing, that IPTV offers perhaps the greatest potential in the next few years.



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This is not news to suppliers and as a result, there is a fiercely competitive market almost wherever you look. Not only online suppliers compete against each other, but also against the existing, well established video suppliers throughout the world. There are cable TV companies in the US, satellite broadcasters across Europe, MEA and Asia and local broadcasters, often operating analogue services in valuable spectrum space, VHS (*Video Home System*) and DVD (*Digital Video Disc*) players are almost everywhere - in short, there's no lack of choice. So how is IPTV faring in the face of these odds and what hope does it have for the future?

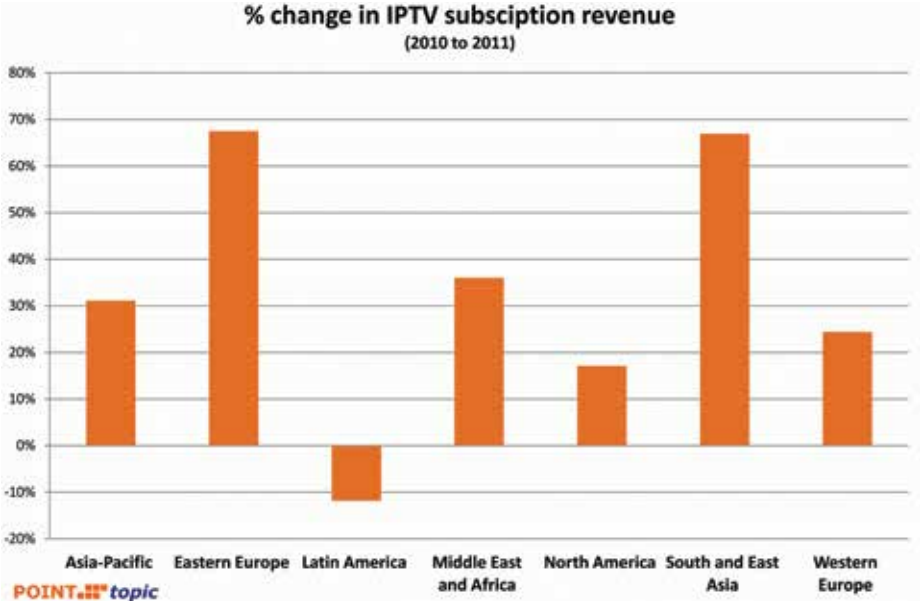
The picture so far, on a global basis, looks fairly smooth although in broadband terms growth is best described as 'stately' bordering on slow. The relatively straight upward line masks a rougher ride in many markets, with good quarters and bad for IPTV suppliers, but the fact that subscribers continue to move to IPTV is significant.

Although growth stalled to an extent in 2011 against what we might typically expect to see, the uptake in revenue has been significant. Taking a close look at the regions at either end of the scale allows us to 'bookend' the IPTV ecosystem. There are three primary obstacles to IPTV growth:

- **Bandwidth** - the majority of Europe has access to enough broadband bandwidth to allow access to IPTV
- **Price** - cost is a major obstacle to take-up. In Europe, ISPs have offered tempting prices to gain a customer base and competition has kept the tariffs down
- **Legal issues** - regulatory aims have the consumers' interest as a top priority and there are moves to liberalise the markets further.

These factors mean Europe has the most IPTV subscribers of any world region, the highest penetration and some of the best pricing. They also indicate that the future is only going to be more competitive.

Although South America currently reports a lower number of IPTV subscribers, it is the Middle East and Africa that suffers from the highest entry barriers. Higher bandwidth is coming, but not everywhere. It will not benefit all consumers and here we see a major distinction between much of Africa and countries in the Middle East. Qatar, Bahrain, Dubai and much of the Emirates have high penetration of high-speed internet services, but it tails off at the 'Near East' (Jordan,



Lebanon for example), with Israel as the exception. Therefore, the bandwidth barrier in the Middle East is largely far less of an issue than in Africa.

Many African nations are only just starting to launch higher speed services. However, the lack of infrastructure and the high pricing that is beyond the reach of much of the population mean that delivery of IPTV over fixed connections will only address a small percentage of the potential market. Mobile services, over satellite or 3G and even LTE, offer some relief to the infrastructure challenges but at a high cost. Deployment is relatively inexpensive. Subscriptions, customer equipment and the cost of data however, are not.

Price is likely to be the hardest to overcome. The income disparities can be significant and what may be accessible for a small percentage of the population shows no sign of being available to the masses. In Mauritania, for example, a low speed entry-level fixed service can easily cost 25 per cent of the average annual wage and that is without any services on top.

We estimate that the global run rate for IPTV subscription revenue was equivalent to US$25 billion per annum at the end of 2011, up over 30 per cent in the year. This compares, for example, with the total pay TV market in North America of around US$70 billion in 2011.

While the total revenues are considerable, the chart above does throw one of the core problems for IPTV into sharp focus. In Latin America even with an overall growth in subscribers and new markets opening up, there has been a fall in IPTV revenues!

Margins are the answer. Not only is it expensive to install and deploy a fully functioning IPTV system, complete with head ends, content agreements, marketing and changes in bandwidth demand, it's difficult to make much net profit per user once up and running.

Entrenched alternative providers fight tooth and nail to preserve their market share and the availability of free content online. This poses significant barriers to pay-IPTV adoption and is exactly what we are seeing in some South American markets. In order to attract any consumers at all, the initial bundles (IPTV almost always comes as part of a bundle) are priced very competitively. Sometimes it is cheaper to take a video bundle than a standalone broadband service, with the ISP gambling that they have a consumer for an extended period, once the consumers start using their IPTV services.

So, at the moment, IPTV is growing in fits and starts. It is expensive to deploy, the competition is fierce and the margins are tight. How bright can the future be?

If it's online, offline or broadcast, video will win no matter what

Recent data growth path may be bumpy and inconsistent but it is generally upwards. Throughout the world and within particular markets there are pockets of resistance. Bandwidths are not high enough, coverage is

[1] *Deloitte. (n.d.). Retrieved from http://www.webpronews.com/deliotte-media-study-2012-01*
[2] *Report/Nielsen, D. (n.d.). Retrieved from http://www.dslreports.com/shownews/Nielsen-Almost-Acknowledges-Cord-Cutting-Is-Real-118318*

"Estimates based on a study from Deloitte1 indicate that up to 20 per cent of current pay-TV customers in the US are thinking of 'cutting the cord' and getting their video from the internet in 2012. Tending to support this, Report/Nielsen2 has released research early this year suggesting that broadband-only households were increasing relative to those taking offline TV (non-Internet) services. They stop short of rounding off the conclusions, at least in public, perhaps waiting for further concrete information before calling it a 'trend'."

incomplete, local services are too cheap and so on. This will continue for some time. As we have noted above, the North American pay-TV market is worth fighting for. Even in the USA, where war chests are biggest, penetration is high and where legislation can be shaped by special interest groups, the walls are crumbling.

Estimates based on a study from Deloitte[1] indicate that up to 20 per cent of current pay-TV customers in the US are thinking of 'cutting the cord' and getting their video from the internet in 2012. Tending to support this Report/Nielsen[2] has released research early this year suggesting that broadband-only households were increasing relative to those taking offline TV (non-Internet) services. They stop short of rounding off the conclusions, at least in public, perhaps waiting for further concrete information before calling it a 'trend'.

This pattern, at least using an unscientific trawl of various bulletin boards and methodologically dubious surveys, does seem to be common throughout the IPTV deployed world. Consumers like the price, like the choice and the convenience of getting a single bill. These advantages, when put together, have convinced many that they don't need to sign up for additional video delivery systems.

It is not going to get any easier either. Increasing innovation in the business models, better content availability coupled with ever improving consumer understanding and plain old word of mouth all add to the momentum. In light of this, and factoring in the resistance in each market the forecasts make promising reading, at least if you're delivering video online. Our estimates put the global pay IPTV market at 250 million households in 2020. To put that in context, that is still less than a quarter of what we expect the fixed broadband subscriptions to be. Quarter of a billion users worldwide will generate, at today's rates, annual revenues of US$110 billion for the IPTV suppliers.

The markets and the woolly mammoths

Offline (non-Internet) suppliers continue to wrestle with their response to the online threat. Adopting varying strategies depends on where they are in the value chain, how much vertical integration they are allowed or are able to indulge in. It also depends on which market they are addressing and what regulations govern this territory. The only way to protect an existing business model completely from an incursion of Internet-TV is to operate in a closed market with a closed network and a monopoly on supply, as can be seen in some areas of the US. Regulators continue to try to limit these cases and open the markets out to other suppliers but can often be frustrated by local conditions.

Previously, network owners were able to choose what was delivered over their network. The internet has changed that. The acceptance and enforcement of net-neutrality policies is exposing consumers to alternate sources and while suppliers are not pleased at losing a competitive advantage, they have not had much success in opposing the overarching philosophy. Instead, we're seeing some alternate strategies emerging. For example, Comcast in the US will allow individuals to access video from other suppliers, but the bandwidth consumed comes out of a monthly allowance, currently 300GB. Video from sources that they sanction (or rather over what is said to be a separate private network) does not. According to many, this directly breaches the spirit, letter and intent of current US federal legislation. Comcast argues that it does not.

This approach is being watched carefully by others in the market. It could easily set a precedent. Much of the rest of the world however, currently seems keener on enforcing net-neutrality to the extent of enshrining it in law. In theory, this is a more consumer friendly approach. More competition and more information should lead to better pricing and choice. Exactly how this will shape out is difficult to see in detail, but if we look at other content sectors, newspapers/magazines and music for example, there are some common threads.

Advertising revenue is down across the board (it is cheaper online). The number of large suppliers has reduced (or consolidated) but the number of small suppliers is increasing. Yet revenues are definitely lower per provider. When the ecosystem changes, its inhabitants adapt or die. The number of magazines and newspapers that lost advertising revenue and subsequently tried to launch an online version is almost uncountable. The number of them that succeeded to survive is a tiny subset, and they are often outcompeted by those more established online.

The picture is mixed for organisations that depend on content for revenue. For instance, the music industry has been battling against online service providers since the first file was shared. There is much talk of piracy and varying attempts to restrict usage from rootkits installed by Sony to DRM from Apple, none of which have been met with open arms by consumers. Amidst this, profits and revenues seem to be increasing. The consuming public does, by and large, behave within most boundaries, money is paid, music is bought and not copied and incomes for content creators and distributors are still going up.

Video falls somewhere between these two camps. On the one hand, content does generate revenue and if exposed to a larger consumer base, will generate much more of it. On the other, advertising is an important but diminishing revenue stream. Extrapolating, we can see that continued dependence on advertising revenue has to change or the risk of a downward spiral taking hold is very real. The generation and delivery of content and associated licensing and subscription revenues will continue to be the growth area of online video but the non-internet pay-TV market will struggle to maintain their market share, margins and incomes as global warming comes to the internet. ●

Content is king - and the secret of surviving VoD

by Mihai Crasneanu, CEO Grey Juice Lab

No one argues that Content is King, but many new OTT (*Over The Top*) entrants are now operating in the VoD field, and some are enjoying great success. It is now essential to add value, such as Netflix's Cinematch that enables consumers find the desired content - or the content to find them! The demand for interactive viewing experience opens up opportunities for carriers, but they must find their unique differentiation, as VoD titles quickly become commodity. Carriers need to navigate through numerous value-chain options. If they desire exclusivity they need to negotiate content rights, and that has become complex, expensive and time-consuming. Multi-terminal rights and multi-territory rights are harder to obtain, yet this is what consumers now demand. Carriers may benefit from expert advice on the content value chain and on what and when various content rights should be secured.

Mihai Crasneanu is the CEO of Grey Juice Lab, an expert in non-linear content, which helps top tier operators in Asia, Europe, Middle East and Latin America to acquire, package and market on-demand and OTT video services to their consumers.

Previously, Mr Crasneanu was the CEO and founder of glowria, which is now on the Paris Stock Exchange under the name Video Futur. It is the largest independent VoD white label operator in Europe and France's largest online DVD rental company, with more than 30,000 titles negotiated with the Major studios (Warner Bros., Sony Pictures, NBC Universal, Paramount, Disney

Prior to creating glowria in 2002, Mr Crasneanu was VP International for UOL, largest online provider in Brazil. He launched UOL in seven countries (Five Latin American countries, the USA and Spain), becoming the leading ISP and portal ahead of AOL and Terra. Before joining UOL, he launched Latin America's first webmail white label platform for clients including Telefónica. Prior to that, Mr Crasneanu was an IT consultant for companies such as Intel Europe, TotalFinaElf, Renault, Saint-Gobain and BNP Paribas.

Mihai Crasneanu is a Romanian-born French citizen. He speaks six languages and has a degree in engineering from EFREI (Paris).

The television landscape has changed significantly over the past 20 years. With the introduction of the internet and subsequent media convergence, audiences demand active engagement in a more interactive viewing experience. Broadcasters and operators now face the challenge of adapting business models to these new usage patterns to retain audiences and achieve return on investment.

As these trends in video consumption evolve, so do the demands of viewers - the digital TV viewers of today want to watch the content they want, when they want and on whatever device they choose - without paying an additional fee. If they don't get it from their current service provider, consumers are not afraid to find an alternative way, and these alternatives are not hard to access.

As this monumental shift in media consumption takes hold, Video on Demand (*VoD*) and Over-The-Top (*OTT*) services are making a global explosion. Every country is considering them and in less than five years every country will have them.

The VoD and OTT market was traditionally made up of telecom operators and cable operators diversifying their offerings with a move into TV, but something interesting is now happening. More companies out of the operator space - media groups, cinema chains, retailers and independents - are all coming to the party.

As the world's television markets exploding with companies that all have similar VoD and OTT offerings, it is important to differentiate them from each other. If everybody has the same Harry Potter or Batman, why should a consumer choose your offering? Naturally, it is important to have the must-haves. If you are a retailer, Coca-Cola is a must-have product for you, but it is also a commodity that you can buy

it anywhere. Not having it means a customer is likely to go somewhere else, but stocking it means putting it out further into the market. Although it is a catch 22 situation, having the right titles in your offering is essential and it keeps you in the game.

There are different ways for an operator to differentiate its VoD or OTT service. One way is with the devices you're present on and the features you're offering, but more than ever content is the key differentiator. Devices are, of course, necessary and people want the latest new features, but without the content these devices would be silent and no one would use them. The more players you have in the market the more you have to find the content that will make you different from the rest. Differentiation comes from how you select and manage your library - the different genres and different groups of interests, the programming, the marketing and possibly the original content - just as companies like Netflix are already doing.

As consumer demand for content is exploding on every screen, operators - both old and new - are finding that getting their content strategy right is becoming more and more difficult. In today's rapidly changing landscape, operators must overcome a number of challenges in order to maximize content revenues and create winning and sustainable businesses.

There are three key elements to making a successful VoD service - technology, quality content and marketing. Get one of the pillars wrong and the business collapses. Get the balance right and business will flourish whilst obstructing further competition from entering the market. As technology becomes more commoditized, anyone can create a VoD service in a matter of days with little to no budget. However, quality content is heading in the exact opposite direction. With increased competition it is becoming more expensive and much harder to negotiate content rights.

However, there are a number of very successful operators who have achieved this balance and stand out as success stories in the US and Western Europe - Netflix, LoveFilm and Maxdome in particular. Operators around the world look to emulate this success, but there is a lot to consider when doing so. Netflix is an unparalleled service today and actually has been since its launch in 1999 when it invented the unlimited, subscription-based online DVD rental model. It has created a service used by 23 million subscribers with a churn rate as low as three per cent - quite a challenge in any market. A key point of its success has been Cinematch, its unique and unrivalled proprietary recommendation engine that enables subscribers to find the right content among 30,000 titles. Actually, it's not that she/he has to find the right content, it's more that the right content can find them.

The world has woken up to the benefits of 'Content Everywhere' and even without Cinematch, OTT solutions allow for ambitious companies (media, retail or telco) to develop Netflix-like services in their own country by consolidating a very wide and diverse catalogue of premium and desirable content. Combining a Subscription VoD (*SVOD*) based model with very aggressive programming and scheduling, while encompassing all possible types and brands of devices is a recipe for success. Although most regions across the world have plans or projects to develop such services, there are evident challenges that need to be overcome - low internet speeds in certain areas, data capping in others. Ultimately, the biggest challenge is securing rights for a whole catalogue of content, as it would be impossible for a service to exist without it.

So, how far are we from a world in which content rights are universally offered to all devices? Well, there is a reason why the cliché 'Content is King (and Cash is Queen)' has survived the test of time and all the challenges introduced by new and disruptive technologies. There is a myth that with content owners wanting to reach audiences on every device and every platform, it's easy enough for operators to acquire the rights themselves. Unfortunately the market is becoming so competitive and there are so many requests being sent to the content providers, that it is becoming very difficult to acquire content nowadays. It takes a lot of time to negotiate the contracts, it's much more expensive than before and the multiplicity of rights - devices and territories - makes it much more difficult to negotiate. A media group, for example, may have publisher rights for their magazines and television broadcasting, but that isn't VoD - the rights are completely different. Nowadays, these companies have to go to a specific carrier inside a studio with visual rights- something that they did not previously have to do.

The concern doesn't come from forming a relationship with a studio - anyone is able to call a studio, and they in turn are happy to receive business. The main concern is that if you are not a big customer that is willing to spend a huge amount of money, you are going to struggle to get to the top of the pile. When negotiating rights with certain studios it is possible to include all devices in the rights agreement - the question that needs to be addressed is 'cost v benefits'. If it is clear that return on investment (*ROI*) will be guaranteed on all devices or that competition will be blocked from certain rights ownership, then it makes sense to negotiate rights for multiple platforms. Alternatively, if you can see benefit in you owning rights for all devices and by that blocking your competition - go for it. Otherwise, leave costly rights on the table, if they don't fit your device footprint.

The caveat is that some Studios wish to ensure that their premium content is consumed the right way, hence certain restrictions apply. For example, if a consumer wants to watch a high definition 3D movie on a first generation smartphone hooked to a 2G connection, it can be compared to turning up to play against a tennis star in a Wimbledon final with a cricket bat! The experience will be terrible and that is something the Studio's will continue to limit. Operators should build content strategies to be technologically agnostic and every decision should reflect that, so that at every point the platforms can easily horizontally integrate and expand their offerings to cater for additional clients, models and devices.

With the increasing adoption of TV-enabled devices and a new consumer demand to watch content everywhere on any device, there is a huge opportunity for telcos to enhance their consumer offerings with a VoD or OTT TV service. To get the right balance operators should look to the content experts to help them get it right. Content companies can provide operators with consultative advice on all aspects of the content value chain while helping to secure rights for a unique catalogue of Hollywood studio and premium content, allowing the operators to concentrate on what they do best. ●

Beyond Digital: Connecting Media and Entertainment to Future Trends

by Saul J. Berman, Global Strategy & Transformation Service Area Leader, IBM Global Business Services

Moving from analogue to digitized content is not just about digitizing it. Media and Entertainment (*M&E*) providers must find new ways of approaching their audiences. Consumers' behaviours are changing and new audience segmentation is now needed. For example, rather than classify consumers by age and region, behaviour is determined more by the mode of access - on demand, non-linear, on mobiles or via social media. M&E providers must collaborate to provide suitably tailored packages according to the new behaviour. They still need to find monetization models that overcome the lower revenues that digitized connected content is currently bringing.

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Prior to this role, Dr Berman was the Lead Strategy Partner for the Media and Entertainment Practice as well as a Global Strategy & Change Services Leader at IBM GBS. Before joining IBM, Dr Berman was the Global Strategic Change Leader at PwC Consulting. He was also previously with The Boston Consulting Group, a divisional Vice President with Broadway Department Stores and an Assistant Professor of Management at the University of Southern California.

A frequent speaker to industry and strategic planning organizations, Dr Berman was named as one of the Top 25 Consultants of 2005 by Consulting Magazine. He is also an editorial advisory board member for Strategy & Leadership Magazine. Additionally, Dr Berman served as a board member of the USC Film School Entertainment Technology Center and of the Southern California chapter of the Strategic Leadership Forum. He has authored numerous books and publications.

Dr Berman holds a Ph.D. in Management and Information Systems and a MBA in Production Systems and Operations Research from the Graduate School of Business at Columbia University in New York. He obtained a Bachelor of Science in Economics at The Wharton School, University of Pennsylvania, Philadelphia.

Today's 'connected' consumers are empowered. They demand instant access to personalized content on their own terms. To satisfy connected consumers, as well as ecosystem partners, Media and Entertainment (*M&E*) providers must move "beyond digital" to deliver individualized experiences on demand, at any time or place and across devices as well.

By understanding each customer individually - on a massive scale - M&E providers can anticipate what people want and transform marketing into a welcomed service, instead of an intrusion. For those in the M&E industry, digitizing content and digitally distributing it is no longer enough. Success in the connected landscape will require:

- a business-to-consumer (*B2C*) mind-set;
- insight into consumers' digital personalities;
- the delivery of relevant, enhanced experiences; and
- the ability to find new ways to monetize content successfully.

According to YouTube's statistics: "more video uploaded to YouTube in one month than the three major U.S. networks created in 60 years".

About the IBV Survey

The Institute of Business Value (*IBV*) has just released results of its fourth annual

"Television stations are beginning to tap into how audiences are using so called 'second screens' whilst watching TV, and are encouraging the audience to provide feedback and create an online buzz by providing Twitter hash-tags at the start of a show. Some stations are then taking this a step further by using the online feedback to make better informed decisions in order to optimize future offerings."

digital consumer survey: Beyond Digital: Connecting Media and Entertainment to the Future, which questioned more than 3,800 consumers in six countries: China, France, Germany, Japan, the United Kingdom and the United States. The goal was to evaluate current and future digital content consumption behaviours. In addition to the consumer survey, one-on-one sessions were conducted with global participants across the media and entertainment industry. These participants represented the following types of organizations:

- Content owners, including broadcasters, cable networks, publishers and online media companies.

- Media distributors, including cable/satellite operators, telecommunications providers and new media entrants.

- Agencies, including creative services, media services and direct marketing.

- Research organizations/analysts, including industry research analysts and representatives from industry associations.

Greater digital connectedness is here to stay
With this ongoing consumer desire to stay connected in new ways, providers have begun to understand that digitizing content is no longer enough. The industry must evolve beyond the digital era and engage in the connected consumer era.

To better understand the connected consumer phenomenon, the IBM Institute of Business Value (*IBV*) asked more than 3,800 consumers in six countries: "which of the following terms best matches your own approach to digital device adoption"?
Their responses:

• Early adopters, or 12 per cent of the global sample, say: "I adopt the latest and greatest devices as soon as they are available".

• Mainstream consumers, or 35 per cent of the global sample, say: "I purchase at about the same time when many others seem to be purchasing".

• Late adopters, or 32 per cent of the global sample, say: "I am typically one of the last to purchase".

• Stragglers, or 21 per cent of the global sample, say: "I don't typically purchase new devices, I am happy with the technology I have".

The IBV (*Institute of Business Value*) survey found that a 'critical mass' of mainstream consumers is now consuming digital content. So, while in the past providers could concentrate attention on what younger consumers expect and thus reach the majority of connected consumers, this generalization no longer holds true. While age remains an important factor, it is not sufficient to determine what consumers want.

How connected consumers want to consume content

The rampant adoption of digital devices has fuelled the growth of digital content consumption globally. The study found that digital device adopters commonly exhibit four types of content consumption behaviours. They are:

• Viewing on demand, or "I'll catch you later": Also known as time-shifting digital viewing on demand is now the norm. The survey found that already in China, the UK and the U.S., over half of early adopters and mainstream consumers consume online video such as Hulu and Netflix on their PCs and video on demand on their home TVs.

• Non-linear viewing, or "THIS I have to check out right now": In a profound shift from the linear nature of traditional content consumption, global consumers are distracted, decreasingly giving TV their undivided attention. Across our global sample, three-fourths of adults reported surfing the web while watching TV. In the U.S., the figure rises to 90 per cent of mainstream consumers who split their attention in this way.

• Mobile access, or "Do you want that to go?": The place-shifting capability made possible by mobile devices is closely related to the content consumption behaviours of time-shifting and distracted viewing. More than 50 per cent of early adopter and mainstream consumer respondents in Japan, the UK and the U.S. regularly access content on their smart phones or other portable devices. This trend will only accelerate. Internet-enabled mobile devices - including tablets, video-game systems, TVs and Blu-ray players - are expected to outpace PC shipments worldwide in 2013.

• Social consumption, or "How are YOU doing?": This aspect of connected consumer behaviour is not just about connecting with content everywhere - it's about connecting with people everywhere, too. Across the global sample, 46 per cent of all surveyed consumers reported connecting with friends on social networking sites. In the U.S., 58 per cent of early adopters and 59 per cent of mainstream users are already doing so.

Television stations are beginning to tap into how audiences are using so called 'second screens' whilst watching TV, and are encouraging the audience to provide feedback and create an online buzz by providing Twitter hash-tags at the start of a show. Some stations are then taking this a step further by using the online feedback to make better informed decisions in order to optimize future offerings. For example RTL Nederland, a Dutch entertainment company, used IBM analytics technology to explore the social media sentiment around certain TV shows. This helped to better understand audience needs and preferences, and hence increase viewer involvement.

The changing media landscape presents challenges

The availability of connected content has empowered consumers to expect instant access to desired content. It is changing how traditional media is paid for and consumed. Meeting demand for 'connected content' is the key to growth - and even profitability - for every party in the Marketing & Entertainment (*M&E*) segment. To do this, it is critical

to understand three key challenges in the changing media landscape:

a. **Content cannibalization is real**
Traditional media and devices are in decline, including newspapers, DVDs and portable game players. Clearly, printed newspapers feel the impact: breaking news is widely available on their own sites, on social networking sites and other media channels. In China, France and the U.S., our survey found that more than twice as many respondents use online sources for breaking news than printed newspapers.

b. **Mass audiences segments are splitting**: From 2000 to 2009, the primetime TV audience has declined steadily for TV networks, independent TV, public and pay cable TV. Declining viewership of broadcast networks exemplifies that mass audiences are splitting into behavioural micro-segments. Age-based micro-segments may well hold true in some cases, but they cannot be relied upon.

The survey reveals that contrary to popular belief, not all early digital adopters are college age. Distracted viewing and social networking are practiced widely across all age groups. Sixty-five per cent of all respondents aged 55 to 64 reported surfing the Web and texting with friends while watching TV. Of those over age 65 watching TV, 49 per cent surf the Web and 30 per cent text their friends. Clearly, age is not the only distinguishing characteristic for today's connected consumers' digital behaviours. M&E providers need to go beyond traditional age segmentation to master understanding their customers' digital behaviour in order to successfully attract them in segmentation and retain them long-term.

c. **Digital models generate less revenue**: For M&E providers, the shift to digital is problematic because digital revenue streams have yet to deliver value that is comparable to traditional models. Before now, the primary means for generating online revenues has been ad-supported models that have yielded a substantially lower return than broadcast TV, for example. The survey showed that more than two-thirds of early adopters are willing to pay for content. As a result, M&E providers need innovative pricing and payment models to maximize revenues.

Looking ahead

Going beyond providing analogue content to digital channels offers an opportunity to develop more strategic and tailored relationships with consumers. Consumers want their content to provide experiences that are tailored to their particular contexts - both geographic and social - as well as their own preferences. Now is the time to focus on the overall consumer experience, embracing new distribution platforms and expanding revenue models.

What can the M&E Industry learn from these behaviours? Digitizing content is not enough. Media and Entertainment providers must practice new rules of engagement. We believe four major steps can help them as they evolve beyond digital:

1. **Act like a B2C company** - regardless of where they sit in the M&E Value chain, M&E companies need to deliver tailored experiences that match consumers' digital personalities and must find ways to interact directly with consumers, soliciting input and incorporating it at every turn.

2. **Target consumers based on the four 'digital personalities'** (on-demand, non-linear viewing, mobile access and social consumption) - These personalities are not age-based, but instead are based on the combination of degree of access to content and intensity of content interaction.

3. **Deliver relevant, enhanced experiences** - While in the past it may have been sufficient merely to deliver content using digital channels, targeting consumers based on their digital personalities requires a whole new approach. For example, a critical mass of global consumers say they look forward to interacting more personally with digital content - many would like to control sports replays or the angle of a movie scene as viewers. To deliver the desired experiences, content cannot stand alone. Appealing content has to reach the right consumers (by using analytics), when and where they desire it (using a smart, integrated infrastructure), with the right features (such as social media).

4. **Monetize content successfully** - This is the tricky part. Even with tailored, captivating content for their customers, content providers will still wrestle with how to expand their revenue models to fit the consumers' expectations and benefit from digital offerings. These new revenue models will need to evolve beyond a 'one size fits all' mould and offer the relevancy, choice, integration and packaging options that consumers demand.

Getting the required multiple business models right will be the ultimate challenge for the industry, but the expanded ability to create relevant, enhanced consumer experiences will move M&E providers beyond digital and create new value - something we can all look forward to, regardless of our digital personality type. ●

TV apps - effects on the ecosystem

by Michael Lantz, CEO, Accedo Broadband

TV apps satisfy the need for 'campfire behaviour', sharing viewing experience with family and friends, for mainstream TV or for the 'long-tail' online video consumption. Internet connectivity enhances the social aspect of TV and makes on-demand distribution possible. However, change will not come at 'Internet speed' - the TV industry is more conservative than the mobile industry, with longer device replacement cycles. TV apps potential is high: they are associated with longer user engagement than mobile apps and with the willingness to spend on content. TV apps may be standalone or providing feedback, but their real appeal is in providing differentiation in the increasingly competitive TV market.

Michael Lantz is the CEO of Accedo, the global leader of apps and app store solutions for Connected TV and IPTV, which he jointly founded in 2004. He has extensive experience in the converging telecom and media industries. Since founding Accedo, he has been driving development of innovative content offerings and applications for IPTV service providers and CE (Content Engine) companies.

Prior to setting up the company, Mr Lantz held roles at a Nordic management consultancy company, Digiscope and the medical IT company, CellaVision.

Michael Lantz holds a Master of Science in Engineering Physics and a Bachelor of Science in Business Administration.

The world of TV is rapidly evolving and over the past two years, we have seen introductions of the concept of TV apps, both from TV manufacturers and pay-TV operators. New technological possibilities emerge regularly and every generation of devices offers more advanced opportunities. Will there be a true shift of consumer behaviour going forward and how will the ecosystem evolve?

Previous paradigm shifts of television

TV went mass market in the 40s and 50s and from then we have not looked back. From the initial scepticism of the 'radio with pictures', consumer demand quickly proved the attraction of the new media consumption device. Of course, TV has evolved significantly from these humble beginnings to today's immersive living room experience.

Today, I believe that we are seeing a paradigm shift of TV, which I think is similar in importance to the two major paradigm shifts of the TV industry we have seen over the years. The first one was the introduction of commercial TV, which has transformed the TV experience from public service to an industry worth hundreds of billions of dollars globally. The second one was the introduction of multi-channel TV, with the digital distribution technologies first introduced in the 90s.

The first shift defined the TV value chain as we know it today, whereas the second changed consumer's perception of TV from a clearly defined media outlet with maybe between five and ten channels, to something with apparent endless choice and hundreds of channels. With multi-channel TV, came the program guide with a search-and-discovery behaviour, which is key for driving consumer interest in the current paradigm shift.

What makes us love TV?

Some people have long talked about the coming demise of the current TV industry with its clearly defined roles of aggregators (TV channels) and distributors (TV operators). However, the TV ecosystem has proven extremely resilient and TV viewership is higher today than it has ever been before. Globally, pay-TV is still a growing market and new TV channels are launched regularly. Why do consumers love TV? What are the fundamental features of TV, which makes the industry tick?

My personal belief is that it's all about the consumer experience. It is due to the

simplicity, convenience and structured experience of content available in the family's social context, in the living room. This is not going to change anytime soon and is very important to remember for any future TV services and apps. In addition, TV is a social medium, where the 'campfire behaviour' of family and sports entertainment is still very important today, despite the rise of long-tail online video consumption. People love sharing and discussing TV experiences with friends and family, regardless of whether they watch the second season of Game of Thrones, the final of American Idol or maybe the latest Champions League football game.

Internet connectivity is the real innovation

TV apps have been around in TV for at least 15 years. The electronic program guide is the best example of a clear TV app, which solves a clear consumer use case and is launched with a remote control button or by finding the app through a menu system.

The real change over the past couple of years is the addition of Internet connectivity to TV STBs (*Set Top Box*), and to OTT (*Over The Top*) TV devices such as Smart TVs and Blu-rays. With Internet connectivity, distribution of apps became suddenly several orders of magnitude cheaper. Usage of web development technologies has made the deployment costs of TV apps a fraction of the previous costs. Additionally, the declining cost of processing power and the increased quality of the TV screen have made it possible to deploy very attractive consumer experiences.

Finally, an online connection provides the possibility of truly on-demand distribution of content instead of the traditional broadcast experience. Technically, consumers can access any content at any time, which is a fundamental shift of power from the broadcaster to the consumer. Of course, broadcasters are still needed to package and present the content in attractive ways, but they can establish a direct relationship with their customers, which should enable clever companies to create truly innovative program formats.

An online connection to all consumers enables a personalised TV experience. Consumers can share their personal preference or behaviour, to allow for an improved content and application discovery as well as participation TV. Remember, the TV experience, which is about simplicity, convenience, structure and functionality, must improve the consumer experience and should build an easier path to acceptance.

The rise of apps

It is hard to even remember a world without apps. From the humble beginnings in 2008, the rise of the mobile app market over the past 4 years, have been truly amazing with hundreds of thousands of apps in all possible categories. It is easy to forget that mobile apps existed already 15 years ago, when Nokia introduced games and ring tones for their mobile phones, taking the first baby steps on the road towards today's vibrant industry.

It is my firm belief that the TV app industry will thrive, but also that we are about ten years behind the mobile industry. Fundamentally, the TV industry is more conservative than the mobile industry, with longer device replacement cycles, and long content agreements and relationships between companies. This will probably make the industry develop at a more measured pace than the mobile app industry, which exploded from nothing to a billion dollar industry in just a few years.

However, the TV is also the place where consumers spend more time every day than any other consumer technology. In addition, TV is content-driven and not communications-driven like the mobile devices. Finally, consumer willingness to pay for content is traditionally higher on the TV than on PC and mobile. All this should give great opportunities for a thriving TV app market.

Apps in a TV context

So, how will TV apps differ from mobile apps? This will of course be different between apps, but the underlying TV guidelines of simplicity, convenience, and structure still apply. TV apps should follow the same guidelines, and apps, which accept the consumer's mind-set in the TV living room, will without a doubt be more successful than the ones that don't.

Firstly, the main app category that will be of interest to consumers is the on-demand application. A stand-alone application, which includes an attractive consumer interface and content discovery is easy for consumers to accept and understand. These apps will be available both in premium, paid format and in free versions.

Secondly, we see stand-alone applications in other categories. Everything from sports results, games and horoscope to e-commerce, weather and social media will provide value to the market. These apps are easily deployed and will provide value to consumers, but will not be as popular as the pure video-centric apps.

Thirdly, integrated applications, which connect to the broadcast experience, are attractive. Integrated apps will add value to consumers that watch a certain program. These apps can be executed either on the big screen or on a second screen, depending on the specific use case. The key is to provide contextual information at exactly the right time and improve the content experience instead of substituting it.

The winners in TV apps

It is clear that TV apps are here to stay. Usage growth is high and the speed of innovation is high. TV apps haven't yet been accepted by the mass consumer market, but the wide spread roll-out of devices with TV app capabilities will create a critical mass of consumers which will drive further app launches.

In my opinion, broadcasters will have the greatest opportunity to create value with TV apps. With strong brand names, and access to TV-centric content, they have a better possibility of creating unique applications. A broadcaster will create bundles of apps centred on their most important program formats and will use applications to drive viewership and additional revenues.

Pay-TV operators will also benefit from TV apps. Apps can be used as either a revenue generator or a loyalty tool. Most of them are currently using applications as a differentiator in an increasingly competitive TV market, but some see new revenue opportunities from apps as the market matures.

Consumer electronics companies have a head start in TV apps compared to broadcasters and operators, which has resulted in more apps in more markets. However, CE (*Content Engine*) companies are hampered with the lack of clear monetisation possibilities. They need to improve their application ecosystems in order to compete.

Independent developers will provide a lot of innovation in this market. There are still very few developers of TV apps, but this will grow quickly as the technologies become more wide spread. ●

'Social TV'

by Tullio Pirovano, Senior VP Strategic Partnerships, EMEA, KITdigital

A Social Program Guide app is the combination of Social Media with the TV experience. At the Discovery Stage, social media provides help in decision-making, thus comments and reviews of TV programs help to choose what to watch. In the Watching stage, social activity is lower, depending on the type of program. Drama is regarded as low-interaction social type, while comedy and sport, not to mention breaks, are high-social types. At the Reviewing Stage, users can re-review the program and add comments. Real-time shared experience can be achieved by embedding comments, or 'time coding' for others to see them at the right moment, even when watching time-shifted video or Video-on-Demand. Such Social-TV apps enhance the users' experience and provide opportunities for advertising.

As a Senior Vice President of Strategic Partnerships, EMEA for KITdigital, Tullio Pirovano is responsible for driving strategic sales and partnerships in EMEA to extend the company's reach and revenues. He joined KIT digital through the acquisition of Polymedia SpA from TXT group, where he serves as CEO. Polymedia SpA was a leading software vendor and system integrator, specializing in Video Asset Management solutions and professional services for Broadcasters, Telcos & Media companies. At TXT group, Mr Pirovano was General Manager of TXT Polymedia, Executive Vice President and part of the Board of Directors of the group. As General Manager of TXT Polymedia, he was responsible for all the company's activities including business development, sales and marketing, client operations, product development, P&L budgeting and forecasting.

Previously, Mr Pirovano spent 14 years at IBM, where he managed several software projects for important national and international customers, mainly in the field of data communication. During his tenure there, he was responsible for software development and sales support for Datavideo, a solution to broadcast data over a TV signal, thus establishing important relationships in the broadcasting field.

Tullio Pirovano graduated cum laude in physics from Milan University.

'Social TV' is the industry's #1 buzzword. It's thrown at any solution that involves the internet and television. Current thinking (among Venture Capital experts anyway) seems to be that apps are the way to go, with contests and coupon deals as the primary revenue generation vehicles.

We see a different solution: a single, provider-based app that serves as both social program guide and as a remote control. This is tied to individual accounts, so that everyone in the family can access their own personal social input. This last point is one of the reasons we have so much faith in this approach. Handling that sort of data to advertisers can revolutionize the television industry, bringing in an even bigger cash flow, while changing the way ads are bought and sold.

Before I explain how that will work, it's necessary to take a look at the actual process of watching TV. We've found that it can be broken down into three stages: Discovering, Watching and Reviewing, and they all feed on each other in a circular rather than linear fashion.

Stage 1: Discovering

The first question the viewer asks is always going to be 'What should we (I) watch?', and the first place a user will turn for that is the Electronic Program Guide (EPG) on the set top box... which makes it the perfect opportunity for a Social TV play.

The viewer is actively taking part in a 'lean-in' activity. They have not engaged with the programming yet. They are looking for advice.

A large part of what has made today's social media favorites so popular is that they help us in the decision-making process. Facebook and Twitter help us decide what to read, which YouTube videos to watch, what news stories to follow. Yelp helps us decide what restaurants to go to. FourSquare helps us determine which bars are hopping. All this information comes to us at the point where we are looking to make an actionable decision. Gathering information from the social web will be a huge boon to anyone in the Discovery phase. What shows are my friends watching now? What have they watched, recorded and/or downloaded recently? What are most people in my town watching? What about most people my age?

Let's look at how that might play out in real life, circa 2012. Your MVPD (*Multichannel Video Platform Distributor*) would provide

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a Programme Guide app that works on your tablet or smartphone. It would immediately let you customize the default view to something more manageable than all 1,598 channels on offer. It would allow you to see, in real time, what shows were getting the most social activity. You would then be able to see what people are actually saying, tapping into Twitter and Facebook feeds that show real time conversation. You'd even be able to respond to and share those comments without leaving the app. You'd be able to save a show to your DVR and rent VOD movies with just one click. You could even get in touch with customer service.

Each show would have its own robust page, with preview video, photos and stats. You would be able to see reviews and ratings from friends and community. There would also be ample opportunity for targeted advertising, both from the networks, who'd promote their own shows, to brands, who could sponsor previews or launch special features. Since all this would happen before the viewer actually starts watching, before the 'lean back experience' starts, they're not going to mind it. It will feel like research, not an interruption, particularly if we look at where the experience happens - it often occurs long before the actual viewing.

There are many available apps that contain most or some of these features, but they are not tied to any particular cable provider. Imagine how much more useful they would be if they were, and you could download, rent, buy, and get customer service questions answered and give input to the cable company- from the same app.

A notable thing about the new crop of Social TV apps: they highlight the huge volume of chatter about TV shows. It's a constant flow that we're not aware of, because it often comes from different demographics. For instance, teenagers - a far more diverse group than the tech/media crowd we often associate with Twitter. This is another reason for embedding Social TV in the Decision Making process - the behaviour is already there. People comment about television shows in large numbers. A Social TV app would harness that behaviour and make relevant data useful to other viewers.

Stage 2: Watching

Once we have actually made the decision, it is time to watch. Watching is a "lean back" experience. How much we want to lean back depends on the content: sports programs, timeouts and other breaks in the action, can give us ample opportunity to 'lean in' and engage with our peers. By contrast, take a new episode of a crime drama. For many people, this will demand their full concentration. They may want to discuss it at some point, but not while the plot is unfolding. This is not saying that we need to give up on Social TV interactions during the Watching stage - just that we need to make distinctions based on the type of content.

We have broken TV programmes into three categories: High, Mid and Low Social. High Social are shows that have the most commentary during the show, whereas Low Social shows tend to have most of their social activity after the show. To examine the categories more closely, dramas and action shows are Low Social programs: we're engrossed in the shows and don't want to talk to anyone while they're on. The action is continuous and there are no logical places to take a break and start talking. Comedies are Mid Social. It is fun to share the jokes and most comedies don't demand your full attention. There are no breaks either, just ebbs and flows in the plot line. Reality Dramas, shows, like Jersey Shore, are also Mid Social. The combination of slow-paced scenes and 'I can't believe this!' moments makes conversation easier, but we're always watching for a pull on our attention. Reality Game Shows (Amazing Race, the Idol franchise, etc.) and Sports are both High Social. There are defined breaks and the winner/loser dynamic makes for easy conversation.

The biggest challenge of the Watching stage is not that people don't like to chat during CSI Miami. Asynchronous viewing patterns mean that they rarely watch it at the same time. The trend towards on-demand viewing, whether through DVR, VOD or services like Netflix, is growing exponentially. We cannot expect Social Program Guide app users to watch shows at the same time. Fortunately, there are several technologies that allow me to insert comments attached to specific time codes on the recording. That way, a friend can watch along and see comments, seemingly in real time. This can even be a group experience, where each new user adds comments or likes someone else's comment.

Keeping the different ways people watch TV in mind, we foresee the transformation of the traditional commercial break into 'Social Intermissions'. When we watch TV at home, we get in the habit of allowing commercials to create regular breaks. With DVRs and VOD, those breaks no longer exist and so we turn to the 'Pause' button. Scheduled breaks, rebranded 'Social Intermissions', may be welcomed by consumers. Rather than blaring out jingles, brands would use this time to engage viewers with the content they are watching, or at the very least with some sort of social action they can take on the iPad (a poll, a game). This may also ameliorate the reluctance some people have to using social media when they have company: if you are sitting with friends watching a TV show, you are going to be sharing your comments with them, not with random strangers. A planned break that encourages everyone in the room to go online and engage in something social together will make that sort of activity more palatable.

Stage 3: Reviewing

Right after watching a show, we are more likely to review it, when details are fresh. A well-designed Social TV app can prompt that behaviour - either by asking you to rate a show, or utilizing a gaming model that rewards users for ratings and reviews. The app can also aggregate opinions and comments from the social web and review sites like Lost Tomatoes. This adds another metric for users to refer to in the Decision Making stage.

There is use for the time code technology discussed earlier here too: users can be given the option to 'Re-watch and Comment' on a show, so they can go back and insert their comments now that they've seen how the program ends. This presents great opportunity for advertisers: the app can present ways for users to click through for more information on a product they've seen advertised on the show, or a product they've seen via a product placement. A brand could sponsor this recap. Viewers will be receptive to this approach since they have chosen to engage with the recap. Brands can get very specific data on who is buying, when and why.

This loops us back to the Decision Making process. A well designed Social TV app will provide other users with data about those reviews, sliced and diced by age, location, gender and other identifiers. A key data point will be activity from the viewer's own social graphs. When I open my Social Program Guide app, I want to see what shows people are talking about. But mostly I want to see what shows my friends are watching, which ones they're planning to watch and which shows they felt strongly enough about to comment on, so that we can discuss it next time we meet.

In real life or online, it is going to make TV a lot more social.

With Internet TV, quality is key

by Mike Galli, Vice President of Marketing, ViewCast Corporation

Despite the great interest in Mobile Internet, the PC is still favoured for long video watching. The larger TV screen is also gaining momentum. Internet STBs (*Set Top Box*) are starting to surpass PCs. Several European services now provide Internet TV as a hybrid solution with terrestrial local antenna option. Users have developed a taste for Internet TV, but they now demand higher reliability and quality. Advanced compression, wide broadband (*4G*) and improved traffic management enable OTT (*Over The Top*) improve the resolution and video screens are no longer 'Triscuit' size. However, the demand for 'any screen' flexibility presents an opportunity for service providers to win subscribers back.

Mike Galli is the Vice President of Marketing for ViewCast Corporation, a developer of industry-leading solutions that helps companies deliver video to broadband and mobile networks. Mr Galli has more than 20 years of experience in the video industry, including extensive knowledge of IPTV systems, Video on Demand, CDN systems, DRM, online advertising, streaming video, enterprise software, as well as service provider and direct-to-consumer video business models. His diverse technology background is the result of working for a variety of companies ranging from computer networking and Internet to software and telecommunications.

A recent Yankee Group report, 2012 Mobility Predictions: A Year of Living Dangerously, predicts that TV Everywhere (authenticated content models) that include streaming to tablets will provide the most important boost to mobile video viewership by consumers. This should come as no surprise, as the iPad 3 has proved to be another hot seller for Apple, adding to the more than 55 million iPads sold since it was launched in 2010.

With my personal interest in the field of mobile technology devices, I notice that more and more of our mobile society is consuming media via the Internet, utilizing their mobile devices. Going hand in hand with the increased adoption of mobile devices as a source for media delivery are the numerous opportunities for broadcasters, local affiliates and advertisers. Beyond capital expenditure savings, Internet TV enables expanded reach to grow audiences while reaching them directly and interactively, resulting in deeper engagement through rich media communications.

What is driving mobile?

There are two main drivers motivating service providers to provide video service on the Internet and mobile networks: customer satisfaction and new advertising models. We have already seen the effect of NetFlix on the traditional service provider's business. NetFlix's growth in the online portion of their business came about not only from their very simple fee structure, but also because their service was able to achieve a level of quality that consumers were happy with.

The new advertising models would entail ads that are tied into someone's location if they are on a mobile phone, for example. Here, again, quality is important. The ad might be for a new movie or for a new car. However, if it is a video ad, it's important that the ad is of sufficient quality or the user will simply navigate away.

PC delivery is still a focus

Despite the mobile 'craze', many consumers still watch a lot of video content on their PC and many of them also connect their PC to a TV set. In short, the PC has not received the attention that it deserves as it still remains a very flexible and powerful platform. With a high-end processor and a good graphics card, a PC can be transformed into a high-end set top box. Add a tuner card for over the air broadcast and you can watch local TV stations as well as Internet content. Tuner cards today can receive HD (*High Definition*) content and can also provide features such as interactive program guides and DVR (*Digital Video Recorder*) capabilities.

Internet STBs are starting to surpass PCs

When the first Internet set top boxes came out they worked fairly well. In most cases the user interface was not very good and there was not very much content to watch, unless you were interested in low-quality TV stations from around the world or religious TV stations. NetFlix was the poster child for OTT video service and Roku (a company that has spun out of NetFlix) offered a very nice product at a reasonable price, but the industry needed more, and more was what they got. Now it is common for these devices to have NetFlix, Hulu, Pandora, Amazon and other services that today's digital consumers crave. In addition to this type of services, today's next generation devices now offer HD content on a fairly reliable basis.

We are also starting to see hybrid Internet set top boxes. They offer a connection to the Internet as well as another connection type such as a local antenna. To be fair, Tivo has had this product for some time now, although in their case the Internet connection came last. Their service offering, user interface and feature sets are all very high quality. In the early days their prices were fairly high, but today their products are priced well.

In France, Netgem launched a service through the FNAC store chain offering their hybrid set top box that enabled a connection to the local digital terrestrial signals as well as a connection to the Internet. The 'Netbox' was one of the first of its kind and has done fairly well.

The BBC has finally launched the long awaited YouView service, similar to the service that Netgem launched. However, the YouView service has a number of set top box options and very robust content offering. It is expected to do quite well. The BBC may not be the first, but they tend to do an excellent job when they launch services.

How about the traditional service providers?

This opportunity has not been lost on service providers, eager to offer mobile video content and to move away from simply providing the 'pipes'. However, for service providers to monetize the mobile video experience, they must provide a high-quality solution, which is much easier said than done. Additionally, the increase of broadband throughput rates, the expanded availability of broadband access as a result of 4G and Wi-Fi, combined with increasingly efficient compression and transport technologies give service providers the opportunity to offer an 'any screen' experience to consumers - a significant advance in service providers' battle against over the top.

As more take advantage of new Internet TV and video on demand products, the industry standard for higher resolution and bandwidth is raised. Because more mobile devices can function as set top boxes, they now require the same encoding profiles that TV sets do. Although many customers do not have sufficient bandwidth for 1080p, there has been a steady movement from 720p to 1080p, even in the Internet space.

Reaching new video customers

Service providers are also looking to use the Internet formats to reach customers who have been too far away for traditional video service. In this case they are experimenting with Apple's HTTP Live Streaming format to deliver video over their own broadband Internet network to set top boxes that now can receive this format as well as the traditional ones. This will enable more revenue for them and also means that their customers can now enjoy the same user interface and choice of TV and movies.

We have definitely come a long way since dial-up video…

In the early days of video streaming, viewer satisfaction depended simply on delivery. If video didn't stop, stutter or lose synch with the audio, it was considered high quality. Back when most consumers only had dial-up access, the video resolution was very low - showing screens of similar in size to a Triscuit brand cracker, so this was commonly referred to as 'Triscuit video'. It was also common to use a very low frame rate - as low as one frame per second! There was a big focus on audio quality since the video quality was so poor. There were even features to stop the video stream, but to continue on with audio when the bandwidth dropped to a low point.

However, as new devices have started to feature high definition retina displays combined with increasingly popular trends in video usage and delivery, such as live streaming, simulcasting, webcasting, mobile TV and video on demand, end users have evolved to expect much higher quality standards.

Where will we go from here?

Through higher resolution, higher speeds, and higher quality, innovation in streaming media technology and devices will continuously reshape the industry. Service providers, broadcasters, local affiliates and advertisers seeking to grow their subscriber base and monetize the Internet TV opportunity must keep their thumbs on the pulse of new innovations to satisfy the increasingly high expectations of end users.

There is also a need to keep an eye on cool new ideas and companies. For sure Google is one of those and the Google glasses are a good example of something that might cause a whole new video medium to develop. Google, Amazon and Apple are also good to watch in terms of developing a true shift from the traditional service providers.

One thing is certain - we live in interesting times where innovation continues to drive new realities for the future of streaming media on a very connected planet. ●

Mobile video - delivering on consumers' expectations

by Kay Johansson, CTO, MobiTV.

The growth of demand for video-anywhere challenges mobile operators with issues of security and scalability. Delivery issues are intensified by the rapidly launching of wide range of smart devices that are used over networks that have not been designed for video broadcast. They lack facilities such as digital rights and handoff of media as well as discovering, navigating and managing video consumption. These issues can be alleviated with a purpose built Mobile TV platform enabling multi-screen usage and content shifting based on time, place and quality, plus video content management with extensive personalisation options.

Kay Johansson serves as the Chief Technology Officer at MobiTV, Inc. driving the creation, development and deployment of video and TV technologies on hundreds of mobile handsets on all major device platforms. In this capacity, he is responsible for the strategic direction of the company's technology plan. He has been instrumental in scaling MobiTV Inc.'s end-to-end video and TV delivery infrastructure to meet the increasing consumer demand of entertainment on mobile handsets and devices. He is also driving the vision behind the company's DRM offering, its hybrid approach to mobile DTV and its vision for Multiple Screen delivery.

Prior to joining MobiTV, Inc in 2006, Mr Johansson served as the CTO of Popwire, a former Ericsson company, where he led development and product strategy. He has extensive experience building media delivery solutions from server to handset. He is the co-inventor of two patents for streaming and bandwidth adaptation techniques over wireless networks submitted by Popwire.

As smartphones continue to improve and tablets enter the mainstream, consumers are increasingly using their mobile devices to watch live and on-demand video both inside and outside of the home. Being able to choose when, where and on which device content is watched is something consumers are now demanding. Moreover, consumers want to be able to shift video content seamlessly across multiple screens. In this evolving landscape, the trend toward digital media content coupled with advancements in wireless technology, network quality and content availability is changing the way consumers discover, access and view video programming.

The changes in television viewing habits, availability of broadband Internet access, increased digitization of content and demand for multiple device support have created a challenging environment for wireless carriers, cable and satellite operators, television service providers and content providers. As a result, we're seeing an evolving market that is getting increasingly crowded as:

- Wireless carriers offer additional services, including television and video, both inside and outside the home.

- Cable and satellite operators are expanding their services, including offering mobile video and other services outside the home to attract and retain users.

- Providers who distribute video content directly to consumers over third-party network connections, or over-the-top providers, are also emerging in greater numbers.

- Content providers are exploring new distribution channels, including direct-to-consumer offerings and over-the-top models. To monetize these new models, content providers face the challenge of ensuring their content is widely distributed, while simultaneously ensuring it remains controlled and protected.

With this in mind, the question of how operators can best deliver on subscribers' expectations for mobile video, while managing the increased video data load across their networks will be, undoubtedly, a key topic at the IBC 2012 conference. Manufacturers have created devices with larger screens, high resolution and faster processors and, as a result, consumers can easily access video on their mobile devices, and live and on-demand television services have become more available across Internet-enabled screens. In response to this, wireless carriers have rapidly built out 3G and 4G networks, but with picture resolution and device functionality constantly improving and driving mobile video consumption, will this action alone be enough in the long-term?

Innovators in the video technology industry have developed cloud-based approaches that combine all the components needed end-to-end to deliver video from the content originator to the consumer. This technology is used to ingest the video content onto host servers and manage all the software, systems and operational services required to move that content to each consumer's device, wherever they may be located. Throughout the process, the video is delivered securely and can readily scale to support many more viewers, while providing a consistent, high-quality experience for consumers.

Industry observations - solving the toughest challenge first

The first steps in creating such a platform is to solve the industry's most challenging problem: how to deliver mobile video. Providing video to mobile phones and tablets in a way that produces a high-quality, uninterrupted stream and also makes efficient use of the network's bandwidth is no easy task. My experience in the industry has led me to believe the following:

- Many technology companies have only been able to offer discrete components of a solution that the carrier needs, in order to build end-to-end video services, with appropriate quality, scalability and innovation.

- Delivering high-quality live television over wireless networks requires network hand-offs, device authentication, digital rights management and effective use of the network's capacity. Each of these challenges must be met with an overarching commitment to high-quality of experience.

- Differing network standards, operating systems and OEM implementation approaches, along with a constant flow of new device types, acutely complicates the delivery of video across platforms and devices.

- Consumers expect to see high-quality video on their mobile phones. However, historically television and video services have not generally been customized for mobile screens. As a result, discovering, navigating, viewing and managing video on smartphones become difficult, and access to real-time live programs is limited.

- Wireless networks were designed for voice and data traffic, not for dedicated live-television delivery. With data and video consumption increasing rapidly, it becomes even harder to ensure that video services are reliable, efficient and able to scale up to large concurrent audiences while being "network friendly".

The industry is working to address each of these issues with comprehensive solutions that are flexible, easy to deploy and can be tailored to each carrier's network infrastructure and specific needs. These solutions provide a compelling way for wireless carriers, network operators and other television service providers to extend the reach of their programs beyond the home to multiple screens anywhere, anytime.

Overcoming the hurdles

A mobile TV platform must have technology that supports video services across all device types, offering a comprehensive solution that works seamlessly and efficiently with carrier and operator networks. The platform should deliver high-quality live and video on demand content that is optimized on a device-by-device basis. In addition, users should be able to shift content on time, place and quality basis across screens both inside and outside the home. The platform need to provide fast access to programming on any type of screen-phone, tablet, computer, TV, Internet TV-along with personalization tools. This TV-everywhere system should enable providers to gain analytics and reporting of aggregated data related to usage that could potentially lead to additional revenues.

Meeting consumer demand for video anywhere, anytime

With these disruptive solutions, the industry is now furnishing a broad suite of TV and video capabilities to consumers who are increasingly demanding an innovative high quality viewing experience, anytime, anywhere and on any device. ●

Who you gonna call?

by Stef van der Ziel, Founder and CEO, Jet-Stream

Consumers have broken out of the Telco walled garden, enticed by Internet based content, but they want Telco grade reliability and quality as well. The 'best-effort' CDNs cannot cope with premium video delivery, and to-date, these CDNs are not profitable. For premium services, CDNs must actively manage the routing, not just relying on DNS (Domain Name Server) and improve video distribution by caching content on networked servers. Content Providers are unable to achieve this without the network providers, who from their end, also need to collaborate, in order to encourage innovation and satisfy consumer demand.

Jet-Stream founder and owner Stef van der Ziel is an entrepreneur and inventor. He is a streaming media and CDN veteran and innovator. In 1994 at age 21, he was one of the first pioneers in webcasting. In 1996, he managed to overload the Internet with massive live webcasts. He was one of the first to recognize the power of the Internet and its potential to liberate and revolutionize broadcasting. He also identified scalability and reliability challenges. To solve these, Mr van der Ziel invented advanced streaming media focused content delivery technologies in the mid and late nineties.

In 2002 Mr van der Ziel wanted to further design, commercialize and market his technologies and founded Jet-Stream, which today is the market leader for CDN intelligence, CDN technology innovation and CDN technologies licensing for mobile operators, broadband access providers, telecom operators, broadcasters, carriers and cable operators. In 2004 Mr van de Ziel also founded StreamZilla, Europe's leading streaming media CDN that delivers billions premium mobile, web and OTT streams for hundreds of professional content owners including leading brands in sports, broadcasting, enterprises, publishing, video production and studios.

Imagine this scenario: you are paying some of your hard-earned money to watch a football match, or a blockbuster on your tablet, smart TV, smart phone or computer, via the Internet, but the stream underperforms. It was advertised as being high quality, but the quality constantly changes from HD (*High Definition*) to SD (*Standard Definition*) quality. Euphemistically called 'Quality of Experience', the HTTP adaptive bit rate streams switch from crisp full HD to blurry and blocky YouTube grade video. Compare it to snow and shadows in the old days of analogue video, or compare it to blips and buffering issues with DVB-C, DVB-S and DVB-T. That is not what you paid for. You paid for a cinematic experience. You pay for premium content, so you deserve a premium service. So, you want a refund. Whom are you going to call?

Most consumers will first blame their Internet or mobile provider, but the provider will claim that your connection worked and you did not buy the video service from them anyway. So, you try to contact the content service provider… that is, if you can contact them at all. Which online video retail providers offer a call centre that you can call, 24x7, in your own language? They will say that their Internet Content Delivery Network worked fine. So, you won't get a refund. The consumer may try again but after one or two more issues with re-buffering and degraded quality, the consumer is frustrated and walks away from the service. Better rent a DVD, or let's use Pirate Bay! These consumers will complain on social media, damaging the brand of both their access provider and the content provider.

The Internet is dramatically changing the broadcasting industry. Subscribers break out of their walled garden cable TV service and consume content directly over the Internet. Closed cable is dead, here comes open Internet TV! Today's early adopters accept that the Internet has its flaws, but mass audiences who will spend money on premium content will only adopt new technologies when they are a step forward. They do not accept a step back.

With the new generation of smart devices such as tablets, smart TVs, smart phones and smart set top boxes, consumers do not accept

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hiccups or buffering or degraded quality. They expect a broadcast grade service. They want the best of both worlds: the uptime, performance and quality of digital cable, and the open access to content and services of the Internet.

We are not there yet. There are no Service Level Agreements (*SLAs*) between Internet Service Providers (*ISPs*), Content Delivery Networks (*CDNs*) and Content Providers and that needs to change. Without SLAs, everything is just 'best effort' and 'best effort' simply is not good enough. For the mass market to adopt Over The Top premium digital media services, the entire value chain needs to guarantee:

- Capacity guarantees: that tens of thousands, hundred thousands or millions viewers can watch simultaneously for 99.999 per cent of the time
- Delivery guarantees: that every subscriber can access the content at any time, with broadcast grade (99.999 per cent) uptime
- Performance guarantees: that all subscribers can consume the content at the maximum HD quality for 99.999 per cent of the time.

Everything less is substandard and the service level would not meet a true broadcast grade. The Internet is a patchwork of thousands of networks, without any service level agreement. It is a best effort infrastructure. It was never designed for guaranteed capacity, guaranteed performance and guaranteed delivery. The only networks that can match the requirements are the Internet Service Providers. Video content providers simply can't use the Internet anymore to meet the subscribers' demands.

Today's Internet Content Delivery Networks (*CDNs*), which serve out the video streams for the content providers, were never designed to improve the Internet for premium video services. This is not just because they run on the best effort Internet. These Internet CDNs are built around best effort technologies to distribute, deliver and reroute users to local servers.

Actually, Internet CDNs simply don't care about your precious content. For them it is bits and bytes - a volume business. They treat your 'traffic' as a hot potato - the sooner it leaves the network, the cheaper. They throw your content over the fence into telecom operator networks… without caring about performance. Even if Telecom operators deploy Internet grade CDNs deeply into their networks, they won't be able to deliver a broadcast grade service, because the technology wasn't built for that purpose in the first place.

All these CDNs rely on basic, best effort technologies such as DNS and caching.

DNS is a passive system. Internet CDNs assume that end users are in the same network as their DNS server, which is fine for a best effort service, but for a premium service, content providers and end users cannot trust DNS anymore. End users can be sent to dead servers, underperforming servers or to extremely remote servers, killing access and performance of your precious content. For premium services, we need next generation CDNs that dynamically manage per-request routing analysis, sending the end user to the right server - every time.

Caching is a passive system too. CDNs hope that your content can be replicated and cached in real-time but there is no guarantee. End users can experience access issues, buffer under-runs, and fluctuating streams - a terrible experience. For premium content, we need next generation CDNs that guarantee internal distribution and high performance delivery using active distribution and delivery mechanisms - every time.

Selecting the right technology for a CDN is extremely important for your future as an OTT (*Over The Top*) content provider. Today, not a single DNS/caching based CDN is profitable for premium video services. Most CDNs are loss leaders, and if they have some profitability, it is not from video services. The only successful CDNs (*operationally and commercially*) for video delivery are CDNs that use premium, active core technologies.

However, selecting the right technology is not the only issue. It is about forming a value chain as well. Historically, ISPs and CSPs have been reluctant to work together. The Telcos see OTT Content Providers as potential threats to their existing walled garden TV and VoD services. In their view, Internet CDNs get a free ride on their network, to delivery content to subscribers. The Content Providers see Telcos as a dominant monopolist who wants to limit their wish to deliver content services over the top. In their view, subscribers already pay for the network, so why should the CSPs have to pay for traffic?

As long as ISPs and Content Providers keep these polarised positions, they are blocking innovation. They are ignoring the consumers' wish to consume anything, at any time, from anyone, but with the same quality as the get from digital cable. Consumers will seek alternative means to get access to content, via illegal file sharing for instance - and that is not in the interest of anyone. It is now time for telecom operators and content providers to start working together. Not to make exclusive deals or to put content in walled garden scenarios. Not to license content to Telcos, but to work on premium delivery infrastructures together and to create end-to-end SLAs. ●

Changing TV consumption models

by Dominic Elliot, Chief Technology Officer, Cisco UK Service Providers

Several factors, seemingly insignificant, amount to a major change in TV consumption. PC viewing is shifting from short-form on to long-form video. Mobile content is growing fast. TVs are now Internet enabled and the Cloud provides access to content, anywhere, anytime, on any device. Google TV and Apple TV launched last year, truly signal the Internet TV era. Consumers now expect time-shifting and on-demand viewing and interactive social-TV. However, only the Telco can deliver full range of cloud-based media and applications across multiple screens with consistent, high-quality experience. Therefore, despite challenges and OTT competition, there is a great opportunity for carriers.

Dominic Elliott is Cisco's UK CTO for Service Provider, Broadcast and Media. Mr Elliott has been working in the telecoms industry since 1988, working in design, operations and latterly sales on some of the world's biggest and most complex networks. He has been working at Cisco since 1997, holding a variety of technical roles and was responsible for the design and deployment of the Cisco elements of the BT Dial, Broadband and Core IP solutions, culminating in the role of Chief Architect for the Cisco provision of the BT 21cn project.

Having worked on IP NGN deployments across the world with challengers and incumbents, Dominic Elliott is currently Chief Technology Officer for Cisco UK Service Providers.

Today's media marketplace has entered the age of 'More' - more video-capable devices, more video services, and more video traffic than ever before. All of these new devices and services are accelerating growth in Internet video traffic. For example, at peak times, Netflix already accounts for 20 per cent of downstream internet traffic in the United States.

A recent industry survey, which focuses on analysing Internet Protocol (*IP*) networking growth and trends worldwide found that by 2016, annual global IP traffic is forecast to be 1.3 zettabytes - a zettabyte is equal to a sextillion bytes, or a trillion gigabytes. The projected increase of global IP traffic between 2015 and 2016 alone is more than 330 exabytes, which is almost equal to the total amount of global IP traffic generated in 2011 (369 exabytes).

The changing landscape

These three trends - more devices, more online video services and more internet video traffic - are changing the media delivery landscape as we know it, presenting new and pressing challenges for service providers.

Service providers need to differentiate their offerings by delivering more personal, social, and interactive media experiences. By doing so, they make media simpler and more intuitive compared to video services today, which are fragmented across devices, screens, and interfaces.

Another element service providers need to contend with is the demand for mobility in every media service. They need to serve millions of new, unmanaged IP-connected devices efficiently whilst preserving the value of their content, and delivering to new screens and platforms.

Creating a compelling consumption experience

In a business and consumer context, there has been a considerable shift in Video from short-form to long-form viewing on PC, mobile devices and Internet Enabled TVs. The opportunity this represents is to create a more compelling consumption experience, which will drive customer loyalty and provide opportunities to monetize service

through greater levels of personalisation and more targeted advertising.

This opportunity is countered by an increasing demand for capacity on the broadband network. The challenge for service providers is to meet this capacity growth whilst maintaining a sustainable cost base. As high-definition quality and mobility become more important, the service provider network becomes the ideal nexus between consumers, content providers, and web applications. Only the Service Provider - and the Service Provider network - can deliver the full range of cloud-based media and applications across multiple screens as part of a consistent, high-quality experience.

Digital media

It is important to make media consumption simpler and more intuitive. Digital Media is driving changes in the market from the content producer through the network to the end subscriber. The opportunity to leverage these changes presents service providers with a means to reduce churn and increase ARPU (*average revenue per user*) associated with their service offerings. By embracing the new trends in this market, the Service Provider can mitigate the impact on the core bandwidth of these new services.

The impact of Cloud TV Services

In 2012, The Cloud will pose significant challenges, but also presents a tremendous opportunity for service providers. As high-definition quality and mobility become more important, the service provider network becomes an increasingly relevant link between consumer and content. Consumers increasingly want to consume content in their own way, be it in the living room, playroom, on the train or any other forms of travelling.

We are now seeing examples of how the content being viewed is retained in the cloud and the consumer can pick up and interact with that content wherever and whenever they have connectivity. Beyond this lies the ability for the Service Providers to provide services where all of the intelligence is in the cloud, allowing the end user to record multiple channels without any hardware constraint, consume this content and share it through social media platforms. The Global Data Centre traffic is expected to quadruple from 2010 to 2015 to 4.8 ZB (zetabytes), and Cloud specifically is expected to increase twelve-fold during this period.

The journey to a full cloud-enabled infrastructure will not happen overnight. Service Providers have extensive client, network, and back-office investments in place, and cannot simply overhaul the entire infrastructure. That is why migration to the cloud should be considered as an evolution, not a replacement of your network - with each new element providing new revenue-generating capabilities right away, while serving as a foundation for more advanced cloud capabilities in the future. A growing number of products power 'video in the cloud' experiences by bringing live and on demand video together, offering a consistent look and feel across devices whether it's a PC, MAC, iPad, iPhone or Android device.

It is important for vendors to lead Service Providers through the migration, with a unique open software platform, providing a path to an all-IP based video infrastructure. Service Providers can now provide their consumers the ability to move, pause and resume video content on any device, following them whenever they go. Many Service Providers are evaluating how to send live and cloud-based video content to a range of managed and unmanaged devices in and out of the home.

Effective use of the cloud will allow service providers fund major service upgrades to keep pace with the massive growth in IP video traffic, whilst contending with the demand for mobility in every media service.

Scalable solutions for video growth

As video grows to consume 62 per cent of all consumer Internet traffic by 2015, service providers need to fortify the network to accommodate this projected 17-fold growth. Solutions should provide a highly resilient IP transport network that can efficiently deliver video on these massive scales. This combines embedded video intelligence with exceptional scale, performance, lossless transport, and nonstop availability to provide immersive media experiences.

As a result, you can ensure a consistent subscriber experience over multiple endpoints, simplify operation with hitless switchover and inline video monitoring and most importantly reduce total cost of ownership through efficient service multiplexing (video, voice, data, and mobility).

Business models in flux

Technological innovation is accelerating, as evidenced by HD flat-screens, 3D TV, and smartphones entering the mainstream in a matter of months rather than years. Consumer behaviour is evolving, illustrated by the move toward time-shifted and catch up TV services. This however does not sound the death knell for live and broadcast TV. The rise of social TV and interactivity within content will drive greater engagement with the live TV experience. The business model is changing as the complex, interdependent business models supporting the TV industry face pressure to adapt to the Internet age. This pressure is increasing as new and old players explore novel ways to monetize online content.

A topical example is the launch of Google TV in the UK. Users can use Google TV across devices, so you can rent and start watching a movie on your Google TV, keep watching on your tablet on the move, and finish watching on Google TV.

The arrival of Google TV, coupled with Apple TV last year truly signals how Internet TV has moved beyond streaming movies and TV shows from your desktop or laptop. These services enhance the traditional viewing methods by combining movies and TV episodes on demand, thousands of YouTube channels and apps.

The current rate of change in technology, consumer behaviour, and the business model will accelerate our vision of the future of TV, bringing enormous changes in the next five to ten years. While any one of these drivers in isolation would not be a catalyst for appreciable change, in combination they are unleashing forces that will dramatically alter the entertainment landscape - permanently. ●

Video: Re-defining the rules of engagement with the mobile subscriber

by Kerstin Trikalitis, CEO, Out There Media & Chairperson, Mobile Marketing Association (MMA), EMEA

Video can transform the mobile telephone into the world's most personal mass medium. For advertising, Mobile video has the unique ability to engage with consumers. Video is a powerful and succinct method of conveying information, which is easily digestible. The video advert can show how products are used and what benefits they bring far better than text, even images. Mobile video-centric campaigns can stimulate responses and are hard to ignore. Meaningful, perhaps entertaining video adverts are often forwarded to family and friends, spreading the advertisers' message virally.

Kerstin Trikalitis is CEO of Out There Media. Ms Trikalitis is one of the most influential figures in the global Mobile Advertising sector. As of June 2012, Kerstin Trikalitis is the Chairperson of the Board of Mobile Marketing Association (MMA) for the EMEA region. As CEO of Out There Media, an international leader in Mobile Advertising, she is responsible for the company's growth across multiple markets in Europe, America and Asia.

Ms Trikalitis has over 15 years of international experience in the mobile industry and has held leading management positions since 2001. Prior to Out There Media, she was the Managing Director of WIN SA, a subsidiary of LSE-listed mobile services provider and SMS aggregator WIN plc. Previously she was Managing Director of Imako Interactive, which she successfully transformed from a loss-making into a profitable supplier of mobile services that was sold to WIN plc in 2005. Ms Trikalitis started her career in Marketing at Unilever, gaining solid knowledge in Marketing and Communications.

Kerstin Trikalitis holds a Masters Degree in Business Administration from the Vienna University of Economics & Business Administration, and an MBA from ESADE in Barcelona, She is half Danish and half Greek and speaks six languages.

Mobile advertising owes a significant part of its success to its unique ability to engage with consumers. Indeed, no other advertising medium can grip the attention of the advertisement's recipient, start a dialogue with them and thus stand a very good chance of converting them into customers.

In the growing arsenal of tools to maximize consumer engagement, mobile advertising boasts video, which seems to be amongst the most effective. This is because the mobile environment presents us with endless opportunities to attract consumer attention and to communicate more effectively than ever before using sound, image, video, coupons, maps and so on.

The appeal of video is universal and seems to be particularly effective when applied to the mobile telephone handset. It has been said (and proved through several studies) that the average mobile users keep their mobile phone on or by them throughout the day. If we accept this, then it is safe to say that the smart use of video in mobile advertising gives the advertiser the opportunity to create a personal TV channel that broadcasts directly to the target consumer.

Working with clients across the widest variety of vertical markets possible, we have seen numerous applications of video in mobile advertising. As a matter of fact, we work very closely with the creative and/or marketing departments

on the client's side to either find ways to incorporate an existing video into a campaign, or to create a video which will serve as the main feature of the campaign. Either way, video repeatedly proves its popularity and effectiveness as a marketing tool.

There are many ways in which video can form a key part of a mobile advertising campaign. In the case of a new product, a company can choose to present it in a vivid, complete or even fun way, by shooting a video which will be shown on the mobile telephone in the same way as a television advertisement would be broadcast on out TV. For instance, we often work with car manufacturers who present new models at launch using video, in order to be able to show the car from all angles, on the road, showcase key features and functionalities, and so on.

On the other hand, video in certain cases helps companies explain new features, processes or services in a much more direct and succinct way than plain text, or even images. In such cases, an advertiser can shoot a simple and brief video tutorial that will guide the mobile consumer through the objective of the campaign step by step. This not only makes the key message(s) of the campaign easier to digest and remember, but it also gives it an element of "portability" that will allow the user to even take the tutorial to the place(s) where it may actually be applicable.

Finally, the use of video becomes even more applicable - if not, almost, obligatory - in the cases of companies that already are in the business of creating and selling video content. Film and television producers and music companies, amongst others, have the unique opportunity to promote existing and new releases through trailers, teasers, etc. This application of video on mobile has the unique ability to create a buzz or word-of-mouth and thus create expectations amongst audiences and drive traffic and sales.

The above are only some of the applications of video in mobile advertising that we have worked on with clients in various corners of the world. The benefits of using video in our work are virtually endless and extend far beyond just viewing experience. This is because a video clip can be supported by various additional applications, services or extensions that can ensure even more gripping engagement of the consumer with the actual brand or product. For instance, a video can be downloaded and saved for the user who wants to keep it, or it can be forwarded to friends and family, giving it a particular viral edge. In addition a video can be used as the epicentre of a competition where the user can answer questions, suggest features etc. while at the same time playing for prizes.

In terms of technology, specialist mobile advertising companies have the means and know-how to ensure the seamless and effective incorporation of video in a campa ign. Whether the client requires the generation of video content from scratch, to be used in a campaign, or the adaptation of existing content for optimal use in the mobile environment, a mobile advertising company will advise, design and run a campaign that features video in order to ensure the best possible results for the client.

Mobile advertising has the unique ability to transform the mobile telephone into the world's most personal mass medium. The use of video in mobile advertising campaigns is a key driver to that direction and a factor that leads to successful campaigns, brand loyalty and happy clients. Having worked with brands and agencies across three continents and having received numerous awards for mobile advertising campaigns that feature video, I can personally guarantee its effectiveness and urge anyone who has not tried it yet to make it a priority! ●

Is big data the next big thing for telecom?

by Alon Aginsky, CEO, President and Founder, cVidya Networks

The communications industry was made for 'Big Data' - managing vast volumes in real-time. Big Data is characterized by three V's: Volumes (demand for voluminous data), Variety (new types, varied and unstructured, from new sources), and Velocity (rapidly analysed, through distributed processing). Big Data needs big BI (*Business Intelligence*) and analytics, such as the open source Hadoop and MapReduce. This can determine anything from personalized offerings to detected fraud. To capitalise on Big Data, mobile carriers must co-operate with OTT Social Media and in turn, help these Internet players monetise the applications.

Alon Aginsky is CEO and president of cVidya Networks, the provider of revenue intelligence solutions for telecoms, media and entertainment service providers that he established 11 years ago. Alon Aginsky founded cVidya Networks and assumed its lead role 10 years ago, bringing with him over 20 years of management and marketing experience in the telecommunications, software development and network management industries.

Prior to cVidya, Mr Aginsky served as Vice President of Business Development and Business Alliances at C. Mer Industries, where he was responsible for new ventures in Telco customer care, billing, and network-management solutions. He was also Vice President of Sales and Marketing at Mer Tele-management Solutions, where he was responsible for the company's global marketing and sales efforts. In this capacity, Mr Aginsky successfully led the public offering of MTS on NASDAQ. A born entrepreneur, he also helps young startups grow and prosper.

Alon Aginsky holds a BA in Business Administration from New York Technology University.

As the volume of data in the digital universe grows to 2.7 zettabytes, IDC estimates that Big Data will earn its place as the next 'must have' competency. In this article, we will review what Big Data is, what all the hype is about and whether or not it is justified. We will examine some of the key opportunities for CSPs (*Communications Service Providers*) to monetize Big Data, as well as the challenges they will face. Finally, we will determine if Big Data is really the "next big thing" for Telecoms and what you should be doing in order to be a part of it.

CSPs regularly handle billions of transactions and petabytes of data and they have been doing it for years. So, what has changed and how is the Big Data phenomenon different? According to Gartner, Big Data is becoming a metaphor for:

1. Increasing volumes of information
2. Finding information in previously ignored or new data types
3. Hadoop and MapReduce

Let's delve into each of these assertions. 'Increasing volumes of information' refers to the explosion of digital content, which according to IDC will grow 44 times this decade alone, reaching a whopping 35.2 zettabytes. That's 35.2 trillion gigabytes, or 35.2 billion terabytes or simply 35,200,000,000,000,000,000,000. As mind boggling as these numbers are, they tell only part of the story. The most striking thing about this figure is that by the end of this year, over 80 per cent of this information will be unstructured or semi structured. This leads us into the second assertion, which is that this data is coming from new or previously ignored data sources and types, such as log files, clickstreams, social networks, text, images, audio, RFID sensors reads, location information from mobile devices and geospatial images. These data sources and types are increasing at a much faster rate than traditional or "structured" data types and are full of rich information that is challenging to analyze and monetize.

The final assertion, Hadoop and MapReduce, refers to the technologies that are needed to store, manage and analyse Big Data cost effectively. These are not the SQL, or relational databases that we use for internal data or transactional data stored in traditional data warehouses and processed in our ERP, CRM or Billing systems. Hadoop is a collection of open-source, distributed fault tolerant data-processing

components for storing and managing large volumes of structured, unstructured, or semi structured data. It enables applications to work with thousands of nodes and petabytes of data. Hadoop runs on low-cost commodity hardware and it scales up into the petabyte range at a fraction of the cost of commercial SQL based storage and data-processing alternatives. As Big Data platforms such as Hadoop are becoming mainstream, the potential for monetizing this tidal wave of new data is enormous.

It's no wonder then that IDC estimates that in 2012, Big Data will earn its place as the next must-have competency. According to Mckinsey, Big Data is identified as the "The next frontier for innovation, competition, and productivity" and Accel, the venture capital firm behind Facebook and Groupon, has recently created a US$100M fund dedicated to dealing with Big Data.

Another way of recognizing Big Data is to apply the three Vs, namely Volume, Variety (multi-structured data) and Velocity (incoming data needs quick analysis and decision making). Big Data is often defined as data that has at least two characteristics out of the three Vs.

Now that we understand what Big Data is and what the hype is all about, let's examine its implications to the communications industry. Could it also be the "next big thing" for Telecoms? In many ways, CSPs are ideally positioned to leverage the Big Data opportunity. They have been dealing with continually growing sets of data for years, regularly handling billions of transactions and monitoring and analysing petabytes of data. In addition, the Big Data growth is driven primarily by data that is consumed or generated by the Telco's mobile customers via their mobile devices and mobile apps, be it feature phones, smartphones or tablets, all over the Telco's network:

- In 2011 global mobile data traffic was over eight times greater than the total global Internet traffic in 2000.
- More than 50 per cent of Facebook users are mobile users, a staggering 488 million mobile users.
- According to Gartner, in 2011 1.8 billion mobile phones were sold, of which 31 per cent were smartphones.
- According to the Cisco VNI Mobile Traffic Forecast, in 2011 the typical smartphone generated 35 times more mobile data traffic (150 MB per month) than the typical basic-feature cell phone.
- Not only is the smartphone market share growing, but also the usage of typical smartphones has increased threefold since 2010.

To a large extent, it seems as if the communications industry was made for Big Data. In today's ever-changing, highly competitive and complex environments, Telecoms need BI (Business Intelligence) & Analytics to play a pivotal role in helping them to increase ARPU, reduce churn and drive growth and profits. Let us examine how Big Data analytics can help CSPs capitalize on the Big Data wave:

- Powering Telecom BI & Analytics: The most obvious opportunity for CSPs in Big Data is to add Big Data technologies and capabilities to their BI and Analytics. This will enable them to process and correlate new data sources and types with traditional ones, to achieve better, more efficient results and insights. Pricing analytics and Next Best Offer recommendation apps in particular, are classic examples. By analysing structured data (such as actual subscriber usage) and unstructured or semi-structured data types (such as log files, clickstreams and text from e-mails), CSPs can provide more accurate and personalized offer recommendations. The recommendation engine can match price plans and add-ons based also on customer preferences and behaviour, such as sport add-ons for sport fans and free audio book offers for commuters. This helps CSPs decrease the retention costs of existing subscribers as well as identify up-sell and cross-sell opportunities to help drive ARPU and reduce churn. Another example is for fraud management application: by adding Big Data capabilities and data sources and correlating them with traditional data sources, CSPs can optimize the detection of fraudsters as well improve the efficiency and accuracy of recognizing patterns or anomalies of fraudulent activities.

- Cooperate with social network players in monetizing big data: While social network players have mostly figured out their monetization strategy at the desktop, it is not that clear for mobile devices. This fact was recently highlighted by Facebook during their IPO filing. They described the growing use of mobile devices as a risk, as they did not realize meaningful revenue streams from the use of their mobile products. This presents a huge opportunity for CSPs to partner with these players and find a win-win solution for monetizing big data via the mobile channel.

- Data markets: CSPs are positioned at the core of the Big Data explosion and should leverage this to their advantage by taking advantage of the opportunity to sell and monetize this data directly by either creating their own data marketplaces or via 3rd parties. However, CSPs must ensure that they do that while carefully addressing the privacy and legal aspects of sharing this data. Examples of such strategies can be seen in Microsoft's Azure Data Marketplace, the UK based startup DataSift and the recent Big Data initiative by the White House which made 200 terabytes of data from the "1000 Genomes Project" available on Amazon's cloud.

- Democratizing Big Data: Providing small and medium businesses (*SMBs*) with Big Data insights and tools over the cloud to allow them to benefit from Big Data at a fraction of the cost. This saves SMBs the hassle and cost of installing hardware and software, sourcing expertise required for managing Hadoop clusters and the need to employ data scientists and analysts to mine them. Examples of this approach can be seen in the Intuit Small Business Index (sharing Big Data insights with the 'little guy'), with Jigsaw Data.com which is a Salesforce.com crowd-sourcing platform for contacts, and Google's recent Big Query launch of cloud-based analytics services designed to speed up data analysis and sidestep the big-data skills gap.

Indeed, there are plenty of big opportunities for CSPs when it comes to Big Data. As such, it is highly likely that it will become the next-big-thing for Telecoms. However, in order to reap the full benefits of Big Data, CSPs will need to overcome considerable challenges. They will need to adopt new technologies and architectures needed to process Big Data. They will also have to address the limited talent pool of data scientists and analysts required to mine Big Data. In addition, they will need to address the privacy and legal aspects of Big Data in order to remain competitive in an era where information is the new currency, while ensuring that they remain a trusted brand in the eyes of their customers as well as taking into account the differences between Europe and the US. For example, by adhering to policies such as opt-in instead of opt-out, providing clear and fixed privacy policies and committing to erase personal data after X years.

Last but not least is the issue of timing. While CSPs are well positioned to capitalize on Big Data they are lagging behind social networks and over-the-top players such as Google, Facebook and Amazon who entered the game earlier. To overcome this challenge, CSPs need to act quickly and decisively, partnering with key players across the ecosystem to help them capitalize on the Big Data opportunity swiftly and efficiently. The time to act is now! ●

Video conferencing moves to a new level - ubiquity in video collaboration

by Gary Rider, Prsident, EMEA, Polycom

A Polycom's report shows that 66 per cent of business managers believe flexible working has a bigger impact on the business than cutting operational costs and that video is crucial to that. Video can save significant costs of business trips and can improve performance in health and education. Virtual-desking accelerates the shift towards BYOD (*Bring Your Own Device*), and video capability on latest devices is often the driver. Similarly, the availability of Video-as-a-Service (*VaaS*) from the cloud enables delivery of quality video collaboration with the desired mobility. These fundamental changes occurring in both the business and public sectors are driving the use of video as the favourite way of communicating.

Gary Rider joined Polycom in 2010 as President, Polycom EMEA. He leads Polycom's EMEA management team in developing and executing strategies and plans to drive aggressive revenue and market-share growth in the region.

Mr Rider brings to Polycom a wealth of business management and sales experience, a deep appreciation of how to succeed in a geographically complex and culturally diverse theatre, and the ability to lead cross-functional teams. Mr Rider joined Polycom following a successful seven-year career at NCR, where he led the transformation of NCR's EMEA performance to a highly profitable, US$1.75B success story - the largest market sector at NCR. Prior to NCR, he held several senior roles with StorageTek, HP and Digital Equipment. Gary Rider holds an MBA from the Henley Business School, University of Reading.

Video conferencing technology is not an unattainable solution or an exclusive management tool anymore - it is becoming widely accessible for any employee. Video collaboration is already recognised as a mission-critical capability for businesses and a solution that improves teamwork and organisational productivity, accelerates better decision-making and cuts costs. Video conferencing solutions make it easier for organisations to keep their employees and clients connected regardless of their location. Staff can make video calls to conduct face-to-face meetings easily with other people anywhere in the world, using any device.

In the past, HD business-grade video conferencing was limited to a few room-based solutions that were typically reserved for scheduled meetings. As wireless network

bandwidth has increased and mobile network connections expand to 3G and 4G capabilities, companies are now rolling out HD business-grade video collaboration solutions to more and more employees on smart phones, tablets and laptops. Video conferencing is becoming ubiquitous and standard technology in any company, even in small and medium-sized businesses, as work force becomes more and more mobile. Indeed, this new demand for video is bringing the technology to the top of the list of telecoms trends. According to Infonetics, the global enterprise videoconferencing market will hit US$5 billion in 2015 compared with US$2.2 billion in 2010.

Comparing the video markets of different countries, I have observed some trends that have contributed to the expansion of video conferencing solutions around the world. First, video is becoming part of daily life for many people, for both business activities and personal use. The generation entering the workforce now has been raised on video - currently 3 billion videos a day are being viewed on YouTube. Many young people who rely on video in their private life expect to be able to use it in the business world as well.

Secondly, now more than ever, saving money and cutting costs is critical for businesses. Traditional costly business trips are no longer as popular as they were previously - due to both financial and environmental reasons. Modern life changes with the development of high technologies and so does business. That is why one of the most effective tools for efficient communication between employees is video collaboration. A company can save a lot of time and money on business trips per year using video conferencing as an alternative and use the resources saved for other business activities.

Another significant trend is the proliferation of mobile devices - particularly smartphones and tablets. Gartner predicts that there will be 320 million tablets sold in 2015 and a growing number are being used within businesses. The 'bring your own device' (*BYOD*) movement has become extremely popular in recent months, with many employees entering the workforce expecting to be able to use their own smartphone or tablet for corporate purposes. Many companies today require mobile devices to be integrated with the corporate infrastructure, which is an indicator of the increased demand for corporate mobility. Bringing consumer devices into the business environment has a significant impact and allows mobile users to be online wherever they are and join video session at any time.

Social networks and cloud services are also a great force for video conferencing solutions. Some companies prefer to move all business communications, including video collaboration, onto social networks and social business platforms. Integrating social business with real-time video is the next logical step in improving how enterprise users communicate and collaborate.

Another important industry development, which will ultimately serve to promote the technology, is the availability of Video-as-a-Service (*VaaS*). Video collaboration delivered through the cloud is a revolutionary way for organisations to keep their employees connected and productive, cut costs and accelerate better decision making, without huge upfront investments. This also means that organisations using VaaS do not have to upgrade to the latest software or hardware; their cloud provider will do that for them as part of their contract.

Some argue that a relatively low quality of 3G networks in some countries is preventing the wider spread of mobile video services. From my point of view, it depends on the type of video collaboration solution used. If a company has deployed the necessary network infrastructure, it is easy to use mobile HD video everywhere over WiFi and 3G networks. Today it is possible to hold an HD multi-person video conference from a tablet or smart phone with as little bandwidth requirement as 500 kb. As soon as those countries invest and extend the reach of LTE technologies, any potential connectivity problems will be eliminated on a mass scale.

In general, video is becoming much more widely used in all industries - from the enterprise to schools to healthcare industries that use video to extend their services, make decisions faster and enable flexible working while cutting costs. A recent survey commissioned by Polycom that questioned business decision makers across EMEA found that two thirds (66 per cent) believe flexible working has a bigger impact on the business than cutting operational costs and that video is a crucial element to a flexible working strategy.

In healthcare, the use of videoconferencing in administering certain treatments is proving not only to save significant costs but also to provide a much better standard of care to patients. A number of NHS Trusts in the UK, including NHS Cumbria and Lancashire and NHS Surrey, are offering 'telestroke' services whereby patients arriving at hospitals outside normal working hours can be seen by remote specialist consultants via videoconference, providing essential around-the-clock access to specialist care. The increased speed of diagnosis that this service allows is vital as a drug treatment can only be given within four hours of the onset of a patient's stroke. The telestroke service has improved care, made more effective use of scarce medical expertise and enabled the NHS to reduce costs significantly. NHS Cumbria and Lancashire Cardiac and Stroke Network alone estimate savings of £8 million a year.

In education too, video conferencing is beginning to gain recognition as a valuable tool in achieving cost savings and improving learning. For example, remote primary schools in Dumfries and Galloway in Scotland are using video conferencing technology to teach musical instrument lessons. Not only does the technology save money and make teaching more efficient (since teachers do not waste time travelling between schools) but it has enabled a new approach to learning at these schools. Teachers benefit from regular Continuous Professional Development (*CPD*) sessions and pupils have been able to connect with schools in Poland and the Caribbean and get a taste for how pupils learn in other countries and cultures. Teachers are impressed and excited about the opportunities video conferencing opens up for students to engage with other students at other local, national and international schools.

With high-quality video conferencing being increasingly relied upon, both by businesses and certain public sector departments, it cannot be long before the technology becomes truly ubiquitous. IDC estimates that the world's video market will grow by a significant 18.7 per cent this year. I predict that video collaboration will become a mainstream and important tool in business, healthcare and education. Over half of all communication is visual - "Seeing is believing" - it is a powerful tool. Video is going to become a mainstream communications tool that will be mission-critical for businesses. It is changing the way we work and communicate, and will soon be the preferred form of communication. ●

Content may be king - But where is your audience?

by Leah Belsky, General Manger, EMEA and VP Strategy, Kaltura

Video is a transformative, horizontal technology that has the power to change our life style. The audiences are not only to be found within the youth consumer market. It is actually found where people spend a large part of their time - at the work. The Enterprise begins to appreciate the power of video and even traditional organisation are becoming media companies, generating content and addressing their customer base directly. The second large audience is found in education. Video is instrumental in finding new ways to communicate knowledge, and media literacy is a fundamental part of training. Media companies who bring content to where this audience actually is, i.e. in these different industries and vertical markets, are set to be the leaders in their field.

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Leah Belsky is a graduate of Yale Law School, an advisor to numerous start-ups and non-profit organizations, and she sits on the board of Public Knowledge, a leading DC organization dedicated to freedom on the internet.

As today's digital landscape becomes increasingly competitive, both technology and content providers are driven by a constant search for the audience. They promote content proactively, create mechanisms to distribute it across the web and enable viewing on any device. Locating the audience is not only about bringing viewers to destination sites. It is about getting content out to places where viewers engage, where creators create, and where new users live and discover. This perpetual search for the audience is a key driver behind technological innovation as well as new content development.

In the video space in particular, theories about the audience are key drivers behind the type of delivery mechanism used, the form of monetization tools employed, and the stories created. Yet too often, the video industry is driven solely by the consumer web and consumer electronics world. Content producers race to be one of the top sites on the next year's Alexa or Comscore ratings. Technologists are fixated on the latest 'box', device, or smart TV launched at the consumer electronics shows. It is not that these trends are not important. Indeed, if you run a media company, becoming a Comscore top ten site with the latest TV 'box' extensions will certainly be an incredible revenue-generating feat. Yet, in a world where adults spend over 2000 hours a year inside the enterprise and where children spend over half of their waking day at school, those who focus only on consumer entertainment innovation miss a tremendous opportunity to reach and understand their future audience.

In a recent report from Forrester Research titled: 'Activity and Online Paid Content Forecast', 09/09, Western Europe'), the percentage of online users accessing video content online is set to rise from 45 per cent in 2009 to 67 per cent by 2014 - Video becomes the most accessed type of content online. As a comparison, Forrester expects the percentage of users accessing news content online to rise from 53 per cent in 2009 to just 61 per cent by 2014.

The online video world is now emerging out of its infancy. What we as technologists and content creators must embrace is the reality that online video itself is a transformative,

horizontal technology. Just as the iPad has changed the way people work, watch movies, or read books at schools, video too can be a revolutionary tool across industries. Video is changing the way we teach and learn, the way we collaborate at work, the way we communicate with peers, and the way we entertain ourselves. The few in our industry who take a horizontal view and identify innovations and user behaviours in different industries are set to lead. So, where is your audience in 2013 and beyond, and what are the cross-industry trends that future innovators must heed beyond the digital home?

At work: video in the enterprise

Adults today spend over half of their waking hours at work. Increasingly, more and more of this time is spent watching video. Gartner predicts that by 2016, large companies will stream more than 16 hours of video per worker per month. Their clients tell the analysts that the amount of video in their organizations is increasing at rates from 50-200 per cent per year. While this number is impressive, it takes into account only the media watched internally within corporations. It doesn't consider the videos that employees watch as they research and explore across the web during the day. Nor does it consider increasing amount of video produced by non-traditional media companies that is becoming part of our everyday lives.

As an example, Best Buy, one of the largest big box retailers in the world, generate over 70 million views per month across their internet, mobile, and in store sites. Their sites alone include over 100,000 screens. Considering that the third ranked video site on the internet - Yahoo Sites - received 57,762 video viewers a month in 2012, the potential of a company to like Best Buy to convert its viewers into video viewers is tremendous. What is producing these two trends in the enterprise?

Traditional enterprises are increasingly realizing that video is a powerful tool to increase employee productivity and reduce the need for travel and synchronous meetings. Companies are building Corporate 'YouTubes' and unleashing the power of employees and managers to create, communicate, and collaborate with video.

- As repeated regularly in our industry "every company is becoming a media company". This means two things:

- Firstly, traditional enterprises who were never involved in media - e.g. SAP, AstraZeneca, Siemens - are now investing in multi-million dollar studios, video for ecommerce platforms and cross-store media networks. They are connecting content to audiences in order to drive business goals.
- Secondly, as the cost of production and distribution decreases, we are seeing companies that might have formerly bought advertising spots from traditional media companies begin to build audiences directly. They are creating their own video destination sites and through social media, mobile apps, YouTube and dis-intermediating - the traditional audience holders.

So why should the video technologist or creator care? These trends might impact other areas of future online video innovation. As enterprises enable video, they create systems with unique abilities to stream inside internal networks, to recognize and authenticate unique viewers, or to generate complex analytic data. In fact, the challenges that enterprises are working out are not too far from some of the innovations we see as media companies push into the closed network of the home, caching content on local TVs, or recognizing purchasers of content on their desktops, laptops or iTunes accounts. What of the time spent viewing video? If I'm a media company, and I recognize that increased amount of video viewing of all forms will take place during the workday or on consumer-facing enterprise driven corporate screens, I would be wise to think twice about my content distribution and advertising strategy.

At school: video in education

The second place where we are seeing a tremendous rise in online video is in education. We all know that nearly half of a child's waking life - from primary school through university - is spent at school. Yet, many innovators picture the education sector as a technological backwater. We picture old school houses with computers on roller carts, focusing only on educational programming from the BBC, iTunes U, or the new consumer-education leaders.

The truth is that the educational technology space is on the edge of a hockey-stick curve of technological advancement in the video space. As universities deploy lecture capture systems, students bring iPhones and other capture devices into the classroom and professors teach remotely from home, the amount of video flowing through the educational ecosystem is growing exponentially. As the cost of education rises, increasing numbers of educational institutions are employing distance-learning technologies, seeking to recreate the collaborative, face-2-face environment of a classroom online. Education start-ups like 2tor Inc. are finding new and innovative ways to use video to teach basic courses like teaching or nursing, using video as a primary tool for assessment and demonstration.

Yet, beyond the pure technology adoption, what is important about education is that it is a place where the value of video and the way it is analysed is conceptualized in new ways that push technological boundaries. When video is used in the educational context, it's not just to entertain and engage but also to drive knowledge acquisition and learning results. As students are given video assignments, they learn new ways to tell stories and communicate knowledge. Media literacy becomes a fundamental part of their conception of literacy and how ideas can be communicated. Outside of the classroom, the educational research ecosystem then dives into the new trend, generating analysis on how the use of video impacts learning outcomes and student behaviour, developing new forms of video analytics and analysis. They assess how learning via video compares with text or audio-based learning.

If you are a media company and you want to know how to engage and monetize an audience; if you are an enterprise and you want to know how the future generation will work; or, if you are a technologist and you want to create the next communication platform - then look closely at how the next generation learns. Look at how the youngest generation absorbs and communicates information - not only when they sit at home and play on Facebook or YouTube, but also when they learn in the classroom. ●

Advances in Consumer Technology and Behaviour Analysis Affecting Enterprise Video Applications

by Peter Maag, Chief Marketing Officer, Haivision

On-demand viewing, ABR (*adaptive bit rate*) for flexible quality, HTML5 protocol for unified interfaces and multi-domain DRM (*Digital Right Management*) are some of the new technologies enhancing consumers' video consumption. Employees now demand no less to be available at work. Particularly effective for business is the access to supplementary content - augmenting content with associated information, comments, maps and descriptions. Further technologies to address security and privacy issues are needed, such as encryption, forward error correction and multi-bit-rate streaming. The enterprise can utilise the best of consumer technology but it also needs special content and rights management that uses internal processes and workflows.

Peter Maag is Chief Marketing Officer in Haivision. He brings to Haivision over 23 years of proven experience in international business development, sales, marketing, and strategic partner development. Previously, Mr Maag served as Vice President at Hyperchip (telecommunications sector) and at Discreet Logic (multimedia/broadcast sector), developing top-level strategic alliances and channel / OEM partnerships.

Peter Maag received his MBA from McGill University in Montreal (Canada) and his Bachelor of Engineering Science (Mechanical Engineering) degree from the University of Western Ontario in London (Canada).

It is intuitive to think industry's use of high value technology is the catalyst for consumer development as in the phrase 'space age technology', but in many cases the reverse is true. Within the enterprise IP video segment, many users point to developments in the consumer space as specific requirements so that their organizations can gain efficiencies by using IP video in new ways. One example is related to the use of video in medicine. A few years ago, when HD video began appearing on devices in the home, doctors in EMEA began to demand the same level of video quality within their clinical systems to enhance their own efficiency and overall patient care within the hospital.

What is leading enterprise users, such as these doctors, to demand IP video in the workplace? Within the consumer space there has been a dramatic shift from linear to non-linear OTT broadcast. People have gone from surfing broadcast channels on their TV sets to on-demand viewing and rich media experiences. It started a few years ago with simple time shifting on digital video recorders such as TiVo, and now cable companies and providers throughout EMEA offer shows both live and on demand, across all platforms. If you miss something, you can always view it at a later time.

With this dramatic switch from linear to on-demand-anywhere viewing, content providers, in many cases, use associated metadata to create very rich media experiences. I was recently watching a broadcast and was able to access a whole world of supplementary content - maps, commentary, notes - which added significantly to my enjoyment of the TV show. The Internet brings providers significant opportunity to deliver other information around a given piece of content such as a television show - subtitles, descriptions, actor bios, related episodes, related shows, and importantly, advertising. It is changing the way people consume videos, and raising the expectation of the viewing experience.

Consumer technologies that are changing the game

Certainly, consumers can't be locked to any particular platform or network, so a number of technologies have emerged to support the best experience regardless of device, connectivity, or location. One of the technologies related to consumer video delivery arose from the need to deliver video across a scale of network and device capabilities while maintaining the best quality video - Adaptive Bit Rate (*ABR*) has

been adopted as the solution. It is because of ABR that the video signals consumers request can be delivered across any platform and any network connection. With ABR a viewer can get a maximum quality viewing experience on an iPad®, a set-top box, and a smartphone no matter what the connection.

Consumers also benefit from the growing variety of media interfaces that are available on phones, iPads, computers, and other devices for delivering the rich media experience mentioned above. A number of frameworks, perhaps most importantly HTML5, are being developed to create unified presentation platforms across a wide variety of devices, which means that the content providers in charge of delivering these experiences do not have to jump between widely varied development environments in order to present a harmonized look and feel. For example, historically broadcasters like BBC might have used HTML and Flash® for a computer, but an entirely different development environment for a mobile device. New toolkits and frameworks make that practice a thing of the past and give developers platform portability. The evolution of player interfaces is making it much easier for companies to present a rich media experience harmoniously across all devices - a notion that is very important when considering the link between consumer and enterprise technology development.

Another technology being deployed for consumers revolves around video security and content protection. Once you get outside the walled garden of linear broadcast, content owners must take every possible measure to ensure their content is not digitally copied. There are several technologies and techniques related to Digital Rights Management (*DRM*) across the different delivery vehicles - set-top boxes, computers, smartphones, etc.

Organizations are feeling the pressure

As these technologies become commonplace in the consumer space, organizational markets - military, medical, education, enterprise, house of worship, sports and entertainment - are pressured to catch up with consumer experiences.

Going back to the earlier medical example, today's clinician is demanding that the media associated with his job (e.g. surgical video) be delivered not only from one room to another within the hospital, but also be made available anywhere using IP video technology. Doctors want to be able to access video from any network, whether they are on a LAN, WAN, or sitting in the coffee shop with their phone or tablet. After all, if they can do it at home, then they should be able to do it at work.

Another example is in the house of worship market. Just as broadcasters aim to reach more viewers, many houses of worship need to extend their reach beyond their local congregations; and they aspire to provide the rich media experiences that consumers have come to expect. To do that, they must be able to reach all of the platforms that people use every day. They need a video platform that can address their constituents in the same way that much larger companies do (think HBO GO), so there is a lot of pressure to evolve their systems to include the same technologies and tricks that are being used in the consumer market.

The pressure from the consumer market is overwhelming for many organizations, and because these markets require more specialized and customized media delivery platforms that match their business practices and workflows, bringing the consumer experience to the corporate /organization space is easier said than done.

Consumer technology in a customized platform

Enterprise users need a customizable platform that takes advantage of the same or similar technologies that have been deployed in the consumer space. For example, they need a system that supports cross-platform interfaces with the same look and feel. The system also must employ ABR technologies in order to traverse any network infrastructure to deliver live and on-demand media to their constituents.

The security challenge is probably the most sensitive consideration for organizations. For example, when delivering content across platforms in a medical environment, the system must provide end-to-end security and encryption so that the institution can adhere to mandated privacy rules invoked by European countries. Within this area of technology, the DRM technologies developed for media companies are not appropriate for employees at work for a variety of reasons and other video encryption frameworks must be considered.

The bottom line is that Enterprise users need to be able to deliver an experience analogous to the consumer space, but they must be able to customize it for the needs of their particular market.

IP video development for the enterprise

A large content provider in EMEA can invest heavily in developing its media delivery platform, but hospitals, universities, or houses of worship do not have the resources to pull all the pieces together. Instead, they must rely on end-to-end solution providers to help them reach their constituents on a mass scale. The elements of their media platform must adhere to the same principles employed in the consumer space as the audience will ultimately have the same demands - ABR for traversing any network, a framework that can serve all devices, and security.

As Enterprise users deal mostly with their own valuable media assets, their user generated content, the end-to-end solution must address the contribute/manage/distribute workflow then incorporate technologies such as encryption, forward error correction, and multi-bit-rate streaming.

The future of enterprise video combines the best of today's consumer technology

Consider a hybrid of some of today's most popular consumer experiences, and it is easy to see where integrated media platforms for the Enterprise will end up. In any sector in the region, people will have access to systems that allow them to contribute, share, and add value to media assets, and securely review the assets with ease.

As their media libraries grow rapidly, organizations have the added challenge of applying a significant amount of metadata into the assets, so that users can organize it, access it, and apply it quickly and easily. Such information must be applied in real-time while the content is contributed, as well as produced afterwards through workflows that extract information automatically (such as speech to text). Organizations now recognize that managing live and on-demand video is even more important than any other corporate data.

No longer is video simply a form of entertainment on our home TV sets. HD video and rich media are commonplace within almost every industry. Enterprise users are demanding a service level equal to that available to consumers, but with customized workflows specific to their challenges. Users must seek suppliers that understand his ultimate goals and deliver comprehensive rich media solutions.

From remote viewing of a medical procedure to broadcasting a church service around the world, video is present in one form or another in nearly every aspect of everyday life. This omni-presence has driven the need to perfect and continually evolve video technology for every possible industrial use - making it truly 'video for all seasons'. ●

The case for Android Pay-TV STB: Tales from the Android TV tranches

by Moshe Bartov, CEO, PeerTV

Android promises to be the next Linux of Pay-TV world, with its wide developer community and its open platform. Android has extensive APIs, built-in security, web browser and numerous readily integrated applications. However, there are many challenges too: it was not designed for broadcast media, lacks TV user interface, cannot provide content protection and its ARM chip base is not compatible with MIPS, which is commonplace in the TV-world. Despite all that, Android based Pay-TV has great potential for innovative service providers.

Moshe Bartov is CEO of PeerTV, an Over-The-Top (OTT) Set-Top-Box (STB) and end-to-end solution provider which recently released PeerDroid, an Android based STB solution for the Pay-TV market. Mr Bartov brings more than 20 years' experience in management, marketing and R&D in the broadcast and telecom sector. Before joining PeerTV, he served as a Senior Product Marketing Manager at NDS, a world-leading vendor of Pay-TV where he managed the NDS middleware product line which powers set-top-box Tier-1 operators worldwide.

Prior to NDS, Mr Bartov served in senior positions at CellGlide, VP Marketing at CT-Motion, Flash Networks and as Business Development Manager at Sun Microsystems where he led the introduction of Java technology in Mobile Phones (J2ME) in and the initial deployment in Europe.

What is Android?

Android, a Linux based operating system for mobile devices represents a major achievement for an open source, widely embraced and supported software stack which today power more than 400 million devices and have captured 59 per cent of the global smartphone market. Through its Google Play application market, it has introduced more than 500,000 applications as of October 2011 and more than 20 billion applications were downloaded by June 2012. Android Inc., which started the development of the Android platform in 2003, was later bought by Google in 2006, aiming to harness its marketing and promote its operating system globally.

Android was designed primarily for smartphones, but its open nature and architecture contributed to its adoption by other consumer electronics, including tablets, laptops, ebook readers and smart TVs.

Android in the Set-Top-Box (*STB*) - the promise

The notion of Android powered set-top-boxes has been discussed in the industry since 2009 and many vendors as well as customers have expressed interest in the adoption of the technology. Android as a foundation for the software to power Pay-TV set-top-box devices present several key advantages:

- Optimised for constraint resources - Android software design grass roots are smartphones which are similar in capabilities (and constraints) to set-top-boxes.

- Extensive APIs for Application developers - Modern STB requires extensive user interface and data representation as well as providing access to third party developers.

- Built in security for application - A 'sandbox' model isolating applications as well as a permission mechanism allow Android to be an extendable environment running market applications while maintaining system integrity and minimising risk.

• 500,000 applications, millions of developers, an unprecedented platform support compared to any traditional Pay-TV middleware, which spells greater access to developers, applications, technology and development tools and significantly reduced development costs.

• Superb web browser - Webkit based browser for those server side middleware and other applications all bundled within the system.

• Convergence-ready - In the world of multi-screen video delivery, customers wish to receive similar services and experience across their STB, Smartphone and tablets. Android, a dominant Smartphone operating system and to some extent a tablet operating system, can help Pay-TV operators offer similar services across multiple devices effortlessly.

In the early 2000's, many STB software vendors have moved from Real Time Operating Systems (*RTOS*) to Linux, as it reduced their costs and extended the availability of open source device-drivers, APIs and interfaces as well as applications. Android provide a much better jump board for developing set-top-box middleware software than what Linux can provide today.

Challenges

Is Android the perfect solution? Developers wishing to power set-top-boxes using Android still face some technological challenges. It is not optimized for TV - The platform was originally developed for a 3"-4" Smartphone with a touch screen and low resolution - as opposed to a Full HD, remote control operated set-top-box interface. This means that many user interfaces elements designed for a 1' distance needs now to be modified to fit a 10" span. Touch, pinch and drag operations need to be substituted with gesture more suitable to a remote control.

The vast majority of Pay-TV services are today based on broadcasting technology (cable, satellite and terrestrial) and require the drivers and necessary software to support receiving this broadcast, handling the video streams as well as the meta-data such as the electronic program guide that is embedded within. All this is missing from Android and need to be augmented with provided proprietary APIs.

There is insufficient chip support. Over the past 15 years the mobile industry has embraced almost exclusively the ARM based chip technology while the TV industry has followed the MIPS based chip roadmap - the two camps speaks different language and are incompatible. Although Android has been demonstrated working on MIPS based, it does not mean that it will support all Android applications. Hence, it is best to use ARM based TV chipset. Only caveat? There are limited choices vendors, such as Marvel, Entropic (Trident), AMLogic and Rockchip. The larger CHIP vendors in the TV industry have also hinted at plans to introduce ARM based chips.

Android, as many modern operating systems, introduces a media playback framework. Because the original design was mobile, the basic media framework support is limited and the multimedia formats are different from those that you are accustomed to find in a set-top-box.

Support for Conditional Access (*CA*) does not exist in Android and support for Content Protection i.e. DRM (*Digital Rights Management*) is limited to Widevine, starting only at Android 4.0. In the OTT (*Over-The-Top*) market there is obviously a demand for much wider selection of content protection means and some require deep hardware integration to really meet security conformance.

Fragmentation - Android has four major releases so far and what is applicable to the TV market is Android 2.3.x and Android 4.0. Android 2.3.x has by far the largest install base and as such enjoys better application support while Android 4.0, recently released, is still building up support.

Should I implement Android STB today?

I believe Android spells a big opportunity for Pay-TV operators, certainly OTT operators looking to lure customers by offering high end set-top-box with rich functionality and exciting user experience. Android also spells reduce development cost, faster time to market of new boxes, new features and large supportive community.

There is great momentum in the industry to adopt Android as an underline platform for both vertical Pay-TV system as well as consumer oriented TV platforms such as Android based Connected TV. Android today is soon to become the next evolution 'wonder', just as Linux was ten years ago. Vendors and operators which starting to invest today, will have a superior product and service and will provide more value and better experience to their viewers and subscribers. ●

A Way for Telcos to Move Beyond Bandwidth for IPTV

by Sharon Mantin, Vice President, Marketing, Orckit Corrigent

While trends in Mobiles are for smaller, smarter and richer devices, the IPTV direction is far from clear. The OptiBand European funded project may provide a 'trajectory' with its recent major technology breakthrough in DSL based IPTV. The proof-of-concept has demonstrated delivery multiple streams of high quality over a single DSL line that can enable several HD channels per household. This means that operators can use existing DSL infrastructure without any change to it and deliver an alternative to the Internet based IPTV.

Sharon Mantin is Vice President, Marketing in Orckit Corrigent. Sharon Mantin has 12 years of experience in marketing, product management and system engineering. Prior to assuming his current position, Mr Mantin served as Product Line Management Director at Corrigent. He joined Corrigent after working for Texas Instruments (TI) as Product Management Manager, responsible for all cable product lines. Prior to TI, Mr Mantin was the Marketing Director at Axonlink (subsidiary of ECI Telecom) responsible for all marketing and product management activities. Previously, Mr Mantin held several system-engineering positions at Orckit communication.

If someone told you IPTV has been around for almost 20 years you might not believe it. After all, high-speed Internet was not even available to consumers until the late 1990s, and until then any kind of video over the Internet was grainy at best, and at worst, unwatchable. In fact, the entire 18-year history of IPTV has been one of differing definitions. Is it a product? Is it a service? Is it a philosophical approach to broadcast?

The questions are many, and because of that, the industry has not yet set itself on a clear course, unlike, for example, the mobile phone industry. With mobile phones, it has been a fairly straightforward process of smaller, faster and more capable devices, and we have yet to see the best of what mobile phones have to offer. With IPTV, however, we are still waiting to understand what the trajectory is.

Within the context of this hazy picture, several aspects appear at this point:

1. IPTV is universally accepted as 'the way things will be', with Internet becoming such a dominant means of communicating;

2. IPTV as a service has been somewhat successful, particularly in Europe, which has seen significant up-take of the technology. In 2011, European IPTV revenues totalled US$4.3 billion, and are expected to reach US$9.3 billion by 2015

3. The overall potential IPTV market is significant, with analyst firm Ovum forecasting it as the third-highest growth opportunity in the industry of telecom

4. The profitability of IPTV is still up in the air, especially for the telecommunication service providers (*telcos*) who are concerned that they will be relegated to the low-margin business of bandwidth providers, while Google and other content providers of the world take the majority of the revenues.

The third issue above is an important one, when considering that IPTV has only achieved seven per cent market penetration in Europe. In other words, there is still time for the telcos to figure out how to be part of the market beyond simply providing bandwidth, which is basically a commodity at this point.

So how will this be accomplished, and more importantly, how can it be accomplished in the context of a market so heavily invested in DSL for access, that it would require a tremendous amount of time and capital to upgrade the last mile for IPTV readiness?

Surely, it is doable, but it is not exactly the telcos' idea of a good time, given the Capital Expenses (*Capex*) and Operational Expenses (*Opex*) required. It all leads to the industry believing that the IPTV opportunity - although promising - may not be financially viable for the traditional telcos in the short to medium term.

Project 'OptiBand',partially funded by the EC under the FP7 program , is a consortium of organizations from across the IPTV ecosystem, including both commercial and academic partners, which has been hard at work over the past two and a half years to develop a solution enabling carriers to bypass this daunting DSL upgrade obstacle. The project recently completed a major technology innovation breakthrough that could dramatically impact the IPTV business model for European telcos. In other words, if successful, OptiBand can play a significant role in enabling the telcos to deliver efficient IPTV services over DSL.

The OptiBand project: An overview

The OptiBand consortium is focused on optimizing the bandwidth of IPTV for the delivery of multiple high-definition (*HD*) streams over a single DSL line, enabling multiple HD channels per household. On the technical side, the project conducts in-depth research and development regarding the efficient distribution of video content while preserving quality-of-experience according to both objective and subjective metrics.

From an economic perspective, the project adds innovation at the content head-end, network aggregation and middleware levels. It does not affect the very large installed-base of (mostly DSL) access network elements mentioned above. This provides a solid and competitive business model for telcos, which will save the cost and complexity associated with the last mile.

Operationally, the project is being developed with five phases:

1. Requirements: Building on end-user inputs, network operator inputs and technology inputs, the functional requirements for the OptiBand IPTV network have been collected.
2. Research: Several work packages have been dedicated to research activities - Algorithm, quality-of-experience (*QoE*) metrics and system architecture.
3. Development: Based on the results of the research, the project has developed prototypes to perform the data-dropping algorithm according to the methods and protocols, which will be analysed and tested by simulation. This prototype system is composed of two parts:
a. A hardware and software solution, implementing the data analysis and tagging at the head end
b. A hardware and software solution implementing the data-dropping at the transport network.
4. Integration: The prototypes will be integrated together in a lab environment to test the functionality and performance of the end-to-end system.
5. Live test: After the OptiBand end-to-end system is integrated and tested in the lab, it will be deployed on a limited scale, for live testing in Telecom Italia's network. This live test will be monitored and evaluated in order to assess the OptiBand functionality and performance in live environment. Feedback from end users will provide the basis for the Proof of Concept (*PoC*) for the project.

The latest OptiBand achievement

Recently, the consortium completed a demonstration of the entire approach. It was executed successfully, which is very good news for the companies involved in the OptiBand efforts, and could, more importantly, be extremely good news for telcos in the future.

An end-to-end prototype was built, including:

- A content head-end equipped with encoder, streamer and Encrypting elements. Encrypted video streams were transmitted from this domain to the IPTV broadcast network;
- An IPTV backbone network including switch/router and packet dropping elements;
- Multiple screens receiving high definition TV from a standard DSL connection in a subscriber's household;
- IPTV middleware that enabled the entire application; and
- A DSL access network that was untouched.

The demonstration successfully delivered two profiles: three HD streams over a 15Mbps DSL connection, and two HD streams over a 10Mbps DSL connection. All streams passed objective and subjective QoE criteria set by the consortium in advance.

End-to-end prototype demonstrated by OptiBand

This means that OptiBand can not only offer an alternative approach for solving the IPTV challenge, but it is able to accomplish it at a high level, given that two to three HD channels per household is what the industry is expecting service providers to offer.

That is not to say that the OptiBand approach is going to be the only way forward for the entire IPTV ecosystem. However, for the traditional telcos who have been staring in the face of the major Capex/Opex associated with extending IPTV within a network dominated by a huge installed-base of DSL equipment, OptiBand may offer the path to profitability - and significant revenue opportunity. Such an opportunity has been sought after since, well, perhaps even the mid-90s, when IPTV was first being discussed and demonstrated. Just as important, it may give the industry a potential clear way forward, which will be necessary for the technology to progress as efficiently as possible. Otherwise, we may have to continue to innovate while ubable to focus on this moving target, which as we all know runs counter to efficiency.

We know the history of IPTV. The question is where the industry will go from here, and whether everyone can agree on definitions, targets, roles and responsibilities for all involved. The industry may want to examine what the OptiBand Project's consortium has done and work to continue the process. ●

More About The OptiBand Project - http://optiband-project.eu/

The OptiBand consortium consists of the following partners:

Name	Country
Orckit comminications ltd.	Israel
TELECOM ITALIA S.P.A	Italy
Irdeto B.V.	Netherlands
FTW Forschungszentrum Telekummunikation Wien GMBH	Austria
Fraunhofer-Gesellschaft Zur Foerderung Der Angewandten Forschung E.V	Germany
Teknologian Tutkimuskeskus VTT	Finland
Universidade Da Coruna	Spain
Corrigent Systems Ltd.	Israel
Arttic Israel International Management Services 2009 Ltd	Israel
Optibase Technologies Ltd.	Israel
Thomson Video Networks SAS	France
Interoud Innovation S.L.	Spain

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Bringing order to the mobile video explosion

by Allan Benchetrit, President, Vantrix

The predicted mobile data tsunami is upon us and the impact of capacity shortfall is unfolding. With every day the bandwidth crunch is left ignored, operators are losing customers. Expanding the infrastructure and rolling out LTE are expensive options while traffic management and bandwidth optimization can maximize utilization of available network capacity. Advanced methods of transcoding, transrating, pacing, adaptive streaming and caching enable more efficient usage of existing resources and improved QoE for video consumers. This involves deeper analysis of usage patterns and integration of Billing with the Policy Control servers.

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Short and long-term network capacity options for mobile operators to ensure the best video experiences for their subscribers

Over the last few years we've seen the mobile landscape headed further and further down a video-centric path. Cisco's latest Visual Networking Index report indicates that mobile video traffic will double every year between 2011 and 2016. As a result, 71 per cent of the world's mobile data traffic will be Video by 2016. With unabated growth in Content availability and the devices with which to consume it, mobile operators are forecasting - or already experiencing - network capacity constraints in the short term.

Yet, mobile operators are increasingly too limited financially and technically to effectively manage the situation. One might say that the issue is one of constrained supply rather than simply exploding demand. It may take a paradigm shift in the economic models between content providers, network operators and ultimately subscribers for us to see the kind of changes required.

Mechanisms for change

The mobile industry is indeed at a tipping point, and the way operators and technology innovators respond will determine both the short and long-term health of the world's mobile networks. There are several solutions available from vendors, many of which are complimentary, to manage data usage while alleviating the capacity pressure on the networks. Here are some of the options, timeframes for deployment/ impact and associated costs: (*please see table 1*)

Bringing it all together through video mediation

Bandwidth Optimization is a cost-saving and highly effective technology. Rather than use a broad optimization approach that treats all content and subscribers the same way, operators should be encouraged to deploy this functionality as part of a holistic video mediation strategy.

Table 1

Mechanism	Time to Impact	Cost
Network Infrastructure upgrades such as LTE, 4G, additional spectrum, increase number of cell sites	5-10 year operator strategy.	$$$
Offload traffic to femtocells or mobile CDN	Mid-term solution. Network impact in 3-5 years.	$$$
Metered Usage and capped data plans	This can be introduced in a period of 1-2 years with most operators requiring sophisticated tools for charging differently per service, subscriber, and content.	$$
Intelligent Traffic Management such as Deep Packet Inspection (*DPI*), Policy and Charging Rule Function (*PCRF*), Flexible Billing Systems	Currently available and being deployed. Network impact in 1 to 2 years.	$$
Bandwidth Optimization including transcoding, transrating, pacing, adaptive streaming and caching	Network impact in 90 days.	$

Cost legend: $ = Millions of dollars $$ = Tens of millions of dollars $$$ = Hundreds of millions of dollars

As a first step, this involves performing deep video traffic analysis that goes well beyond what traditional DPI can offer. By gaining a better understanding of how video is used by subscribers (i.e. sources, time of day, devices, location, etc), operators now have a complete view on the trends of usage patterns. This enables informed decisions towards adjustments for existing services, and potentially the business case for the introduction of new services.

The next step is the integration of the optimization platform with a Policy and Charging Rules Function (*PCRF*) framework and billing system. The PCRF node operates at the network core and is responsible for determining policy rules in real-time. Based on the lessons from the video traffic analysis and a deeper understanding of usage patterns, operators can go as far as to create unique rules and intelligent policy decisions for each subscriber active on the network. In doing so, operators can promote a more customized approach to its offerings such as different Quality of Service (*QoS*) levels and content centric charging models.

Once the policies are in place and integration has been completed with the charging systems, Bandwidth Optimization is then deployed to enforce those policies and safeguard that the resulting services are properly billed for. Various 'lossless' and 'lossy' techniques - including transcoding, transrating, pacing, adaptive streaming, and caching - can be matched up with subscribers and content to reduce latency, improve user experience and drive a more efficient use of the network.

With Bandwidth Optimization technology i.e. the ability to maximize the utilization of available network capacity, operators are able to make real-time adjustments to the way content is delivered to subscribers. As an example, the function of pacing creates optimized traffic 'lanes' on the data highway, tailored to the unique needs of each given user in a video session, allowing more concurrent users on the highway to receive an improved user experience in their video viewing. In doing so, Bandwidth Optimization can effectively free up a significant amount of network capacity, thereby reducing or deferring the OPEX and CAPEX investments necessary to meet the growing demand.

Following the deployment of policy-based Bandwidth Optimization, operators can take one last step to complete their video mediation project. This entails the enhancement of the service quality and user experience for their subscribers. The opportunities here can include the insertion of advertisements during browsing or video viewing sessions, the integration with social networks and location-based services to promote commerce, or even the convergence of the viewing experience across multiple screens. The result for operators is brand differentiation that can lead to new charging approaches and models, ultimately resulting in enriched revenue opportunities.

Quality of experience

One of the challenges with Bandwidth Optimization technology is that quality may be compromised at the expense of compression. As operators begin to evaluate second-generation solutions, the primary goal is shifting from a focus on the amount of bandwidth that can be saved to one of improving the quality of experience. In effect, the best-in-class solutions will shape the way balancing these two important elements is achieved, while providing the operator with objective metrics for measuring the impact of the decisions taken.

The evolution of mobile networks and devices that are spurring consumer creativity and usage in the last few years is certainly exciting for operators, device manufacturers, vendors and subscribers. Yet to ensure that the mobile evolution continues down a path of success for all stakeholders, the industry must address bandwidth challenges that will continue to pose challenges to growth, ARPU and customer satisfaction.

With every day the bandwidth crunch is left ignored, operators are losing customers to the competition. Our industry needs to address the video growth immediately, in a holistic fashion. Video mediation has to become a core competency of network operators, just like voice or messaging have been until now. ●

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