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Thought leadership from Atos

***white
paper***

**Media
Metamorphosis**

From mass consumption to personalized, massively shared experiences

The media industry is evolving at the rate of the technology cycle. No industry is immune to the transformative power of social, mobile, cloud and big data but in media it is profoundly changing how content is produced, distributed and consumed. The audience is increasing in control, and webscale disruptors (Google, Facebook, Amazon, Apple, Netflix) are bringing new personalized customer experiences to service this new market. The media companies that will be able to thrive in this new market, will be those that move now to be able to deliver high quality, personalized customer experiences in scale.

Media Metamorphosis

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This White Paper has been elaborated as a collaboration between Ovum and the Atos Scientific Community. It has been developed by Adrian Drury (Ovum) and Paul Moore Olmstead (Research & Innovation, Atos). It has been reviewed by the members of the Atos Scientific Community: Jordi Cuartero, Mike Smith and José Ruiz Jimenez.

About the Atos Scientific Community

The Atos Scientific Community is a network of some 100 top scientists, representing a mix of all skills and backgrounds, and coming from all geographies where Atos operates. Publicly launched by Thierry Breton, Chairman and CEO of Atos, the establishment of this community highlights the importance of innovation in the dynamic IT services market and the need for a proactive approach to identify and anticipate game changing technologies.

The catalyst

The multi-screen, pervasively connected web is driving mass media from an audience relationship to a socially connected, interactive customer relationship. While major landmark events such as the Olympic Games, the FIFA World Cup or Eurovision Song Contest will continue to be consumed simultaneously by billions of people, the perspective that users take on these events will be increasingly personal, interactive and the experience will become profoundly socially connected with other end-users.

Audiences are being given more opportunities to interact with content and this is already driving changes in linear broadcast. However we are moving from a model of service personalization to end-user control of the actual content itself. This control can be through "basic" social interaction with live broadcast. But increasingly end-user control is possible through multi-view 3D for live events, multi-

threaded documentaries and interactive fiction that blur the boundaries between narrative video entertainment and the cutting edge of games design or Mechinima-style narrative animation. The choices our social graph makes will drive the content that we consume. The boundaries between user-generated content and professionally-produced content will become more blurred. In the long run, our media will be, in some form, user-generated, influenced or curated.

As the audience experience becomes increasingly personal, advertisers will use this detailed knowledge of the user to market to this audience. This will lead to media and publishing companies becoming holding companies for transnational, multi-platform brands. Television will become another integrated digital channel alongside social, search and display.

The four technology forces ultimately driving market change - social, mobile, cloud and big data - are ultimately also the building blocks that will enable the media company of the future to deliver service personalization and content interactivity at scale.

In this collaborative paper between Ovum and Atos and with the input of key opinion leaders in the market, we explore the future directions of media and broadcast industries immersed in a profound transition. This is designed to look beyond the near term realities of multi-screen web distribution and to consider how technology is going to more fundamentally change the premium consumer video experience five years out from now and beyond.

Key messages

- ▶ **Mobile is driving consumer behavior change:** Smart mobility is opening up the media market in two dimensions. It is enabling personalized engagement with audience segments not previously reached, and it is creating the opportunity for a near unlimited range of multi-screen services that enable the users to interact via the **second screen**. Great **multi-screen customer experiences** wrapped around great content will be the key to winning and keeping audiences! **Moving from an audience relationship to a customer relationship:** Media needs to move beyond content service personalization, to personalization of the content itself. **Socially-connected, dynamic content** creates the opportunity for mass media experiences that are unique to any social graph. The foundation for the profitable, scalable delivery of great customer experience will be technology-enabled, smart strategies for **metadata creation and management. New networking & Distribution models to resolve the fixed and mobile capacity crunch**. Growth in rich media Internet traffic, and in particular video, is already creating the threat of a capacity crunch on fixed and mobile IP networks. New technologies such as white space spectrum networks will be needed to deliver low cost high bandwidth wireless broadband services to a growing universe of connected devices
- ▶ **The future for 3D?** Stereoscopic 3D is unlikely to make much of an impact on the living room experience, but **future 3D technologies** such as light wave or holoscopic 3D will create the opportunities for new visual audience experiences
- ▶ **Moving beyond content service personalization, to personalization and content end-user control.** Radically increased personalization and metadata creation will lead to new ways of interacting with content and even new forms of content itself
- ▶ **UGC, consumerization and social interaction with video.** The lines will blur between User-Generated Content (UGC) and professionally produced content and media service providers will have the opportunity to stitch together these content forms to create personalized channels of socially-defined special interest content
- ▶ **The coming marketing revolution and media's role in it.** Media companies need to be delivering not just traditional advertising, but platforms on which brands can build engaging customer experiences that are integrated with the central propositions of their products. At the same time content brands are propagating across multiple mediums which can lead to a reduction in the brand of the medium itself
- ▶ **Solving the digital rights challenge.** Digital Rights Management (DRM) remains unsolved. Until now no DRM system has gained sufficient traction in the marketplace and, at the same time, such issues as user-generated content and dynamically-generated content are making it even more difficult.

These changes are profoundly changing the way media companies do business and how people entertain themselves. But this goes far beyond that, all this is part of the even more important change in the way society communicates and connects.

Mobile is driving consumer behavior changes

In all consumer markets, the mobile, social web is creating opportunities for retailers, brands and service providers to create new customer experiences, redefine how services are delivered to end users and make them stand out from their competitors.

Arguably in no industry is this more true than media. Mobile devices are not just platforms they are shapers of changes in consumer behavior. Mobility and consumer cloud services are creating a socially connected end-user who expects any and all of their media services to be instantly available on any of their devices. Media companies with established audiences that respond by delivering seamless, engaging customer experiences packaged around great content, delivered across any screen will be those that earn the right to own their markets. This is what is enabling services such as Netflix and the BBC iPlayer to win in their markets today. At time of writing, Netflix has 29.8 million subscribers in the US alone. Comcast, the largest conventional pay-TV operator has just 22 million subscribers.

But the scale of growth in the smart device ownership is enabling media companies to engage audiences formerly beyond their reach. Personalized services delivered to the video-capable mobile device, create the opportunity to open up audience segments that were un-engaged by traditional media. If broadcast media can deliver reach, then mobile can deliver greater engagement and draw people to a television screen or radio, and the combination has the potential to be hugely powerful.

Platform disruption and the impact on viewer behavior

Two video distribution platforms stand out as current and future disruptive forces in the broadcast market: Netflix and YouTube. Netflix is exploiting the power of the cloud, mobility, social media and big data to deliver a model for the next generation of personalized, on demand, in home entertainment services, and with scheduling experiments such as House of Cards, is creating new consumption models for audiences in what is otherwise is an on-demand platform.

However YouTube continues to be the most systemically disruptive force in broadcast. It is not only changing the economics of video production and distribution, it is also changing viewer behavior. In the words of Trevor Beattie, founder of ad agency TBWA and creator of some of the most iconic TV ads of the past two decades, the new TV ad format needs to be five seconds not the standard 30 or 60 second spot. YouTube has been a catalyst for "tapas" style content consumption, it will continue to change formats and is rewarding producers working within both established studios and independents who understand the parameters of consumer preference in this channel. It will also continue to be a lab for innovation, new formats and delivery models.

As well, such user-centric applications as Vine and Instagram are redefining the way people interact with video and are providing new ways for content providers and advertisers to reach the millennial generation.

Smart TV and device wars

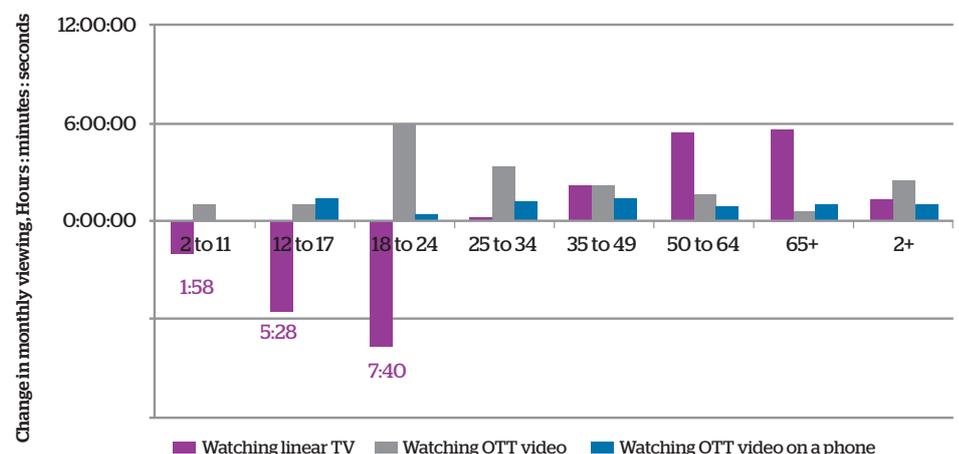
The television and HDMI equipped devices that can be plugged into the television have become pawns in the broader battle for the device, platform and services ecosystem. Premium video services are a core aspect of the multi-screen strategy of Google, Apple, Microsoft, Samsung and Sony and the plays being made by these key market players are establishing

the rules of the game, as well as defining the response strategy from major broadcasters and pay-TV providers. Broadcaster-led initiatives such as YouView in the UK, and pay-TV driven initiatives such as the Now TV Box from Sky are largely defensive.

The integration of web services with free to air and pay-TV broadcast platforms is driving growth in the consumption of streaming video on the television. It is also acclimatizing audiences to new user interface paradigms for presentation of premium video content services that finally evolve beyond the traditional electronic programming guide. Looking forward the market will see the growing "appification" of channels as smart TV and connected device vendors present individual libraries of content in a model that unbundles the traditional pay-TV selection.

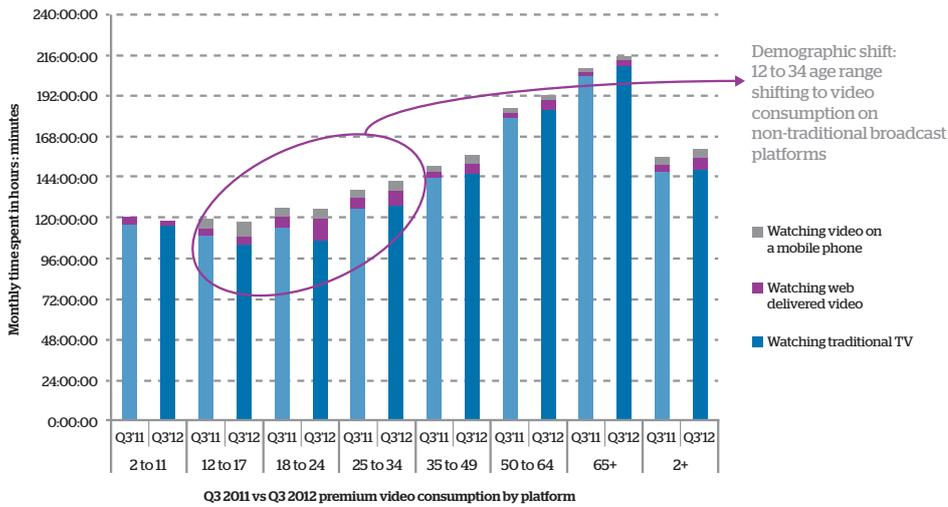
Looking further out, as the major device ecosystem players - and in particular Apple and Google - introduce new wearable technology device categories, whether they be Glass or iWatch, these devices will also be integrated into the broadcast ecosystem. The integration of biometric data into more conventional forms of audience analytics create opportunities for true "emotional" content feedback data, rather than just the flood of clickstream data.

Figure 1: Youth audiences deserting linear TV: 2013 vs. 2012 by age group (USA)



Source: Ovum

Figure 2: New models of video consumption vs. traditional broadcast: US usage in perspective/Q3 2011 vs. Q2 2012



Source: Ovum

The second screen as a new dimension

Not only is the mobile device a media platform in its own right, but it is also creating the multi-screen customer experience. The London 2012 Olympic Games proved to the market that users are willing to experience mass media events such as the Olympics now on two screens - the television and the smartphone.

This second screen becomes a personal lens on an event, a means to interact with content on the main screen, and a means for the user to create his own content around professionally-produced content, whether on Twitter, Facebook or in a Disqus form.

It also creates opportunities for content service providers and content creators to create synchronized multi-screen experiences. Already we have seen companion applications brought to market for a range of live and non-live broadcast content, mobile services designed to accompany experiencing a movie in a cinema and augmented reality for the printed word. Watermarking, optical character recognition or audio syncing, create the building blocks for an unlimited range of services, bounded only by the imagination of the producer.

Moving from an audience relationship to a customer relationship

All those in broadcast will recognize the rapid rate of change currently hitting this market. For Generation Y and Millennials, linear viewing is falling and web delivered viewing is rising fast, catalyzed by mobile smart device ownership and service availability.

Ovum estimates that at the current rate of change, over 30% of all audience viewing hours will be distributed via the web by end of 2017, a growth of >10X from levels today in developed markets such as the US and Western Europe.

This rate of change will have far-reaching implications for the industry's distribution, operations, and business models. It will enable the creation of services that go far beyond today's retail, advertising and subscription business and service models. It is also estimated that multi-screen viewing will soon reach about 80 minutes a day per average user. This will necessitate the full integration of hybrid linear and on-demand operations and will also demand:

- ▶ audience and asset analytics that go far beyond legacy ratings-based approaches to content acquisition and scheduling and media asset management
- ▶ standardized metadata schemas that enable preservation of asset information throughout the media supply chain and the matching of content and user preference at scale.

These changes in the media industry will also require new organizational structures that cross the boundaries of technology, broadcast engineering, and creative silos, and will drive the evolution of strategic approaches to content delivery network asset investment.

Metadata and Customer Data: the building blocks of dynamic rich media customer service

The reality for broadcast companies is an increase in overheads for management of hybrid linear and on-demand environments. Effective personalization of web-delivered multi-screen services, either to monetize directly or to drive users back to the schedule, will require the ability to personalize services in scale, matching end-user requests and preferences.

Today front-running media companies are moving to put in place data management platforms that enable them to effectively match customer behavior and preference data with content, and rich content metadata. This promises the ability to deliver new, innovative services, a better end-user experience, and make smarter content acquisition and production decisions.

Metadata creation: manual & automation

The challenge is cost-effective metadata creation, preservation and exploitation. Metadata today is created along the media supply chain, and preserved, transformed or even just lost inconsistently subject to integration of systems and processes between companies or functions. Examples include MXF (Media Exchange Format), BXF (Broadcast Exchange Format), closed caption or other manually created "tagsonomy" style metadata around content objects.

However today the majority of these processes are deeply flawed. Metadata created may be of interest to that specific function but is not what is required further down the media supply chain. Schemas are often inconsistent and human error is a constant factor. And finally, manually created or edited metadata entails cost. Just as we think today about the Net

Present Value of content, so we need to think increasingly about the International Rate of Return of metadata creation.

One method to reduce costs is to use machine-automated metadata creation, based on audio, text or image analysis linked to a semantic taxonomy. However these technologies today are imperfect, they need manual editing and there is a lot of room for incremental performance improvement.

Socially user generated metadata, the second screen and gamification

An increasingly valuable source for metadata supply is user interaction with content via social media. Twitter in particular creates a stream of near real time user response to content that creates additional semantic meaning for the content, subject to the social graph of the individual generating the comment. There are a number of experiments live today exploring how to use social network-generated content as metadata that be used to drive dynamic publishing, including the **Atos Social Second Screen Program** which uses socially generated metadata to automate clip highlight publishing from live events.

Another key of technology research that has application for metadata creation is **gamification**. One of the challenges of human metadata creation is to drive behaviors that encourage the standardization, volume and relevance of the created metadata. Gamification provides a means to influence the behavior of producers, editors and catalogue management staff. It also creates the possibility of creating end-user focused services that encourage communities of interest to create user-generated metadata.

Automatic content creation and personalization

The next step is to use dynamic tagging and a dynamic ontology in order to be able to control the master data model and enable metadata to transform dynamically. Today this enables automated publishing. The next frontier is to use dynamic semantic publishing to deliver highly personalized content services through any syndication channel using both structured and unstructured data.

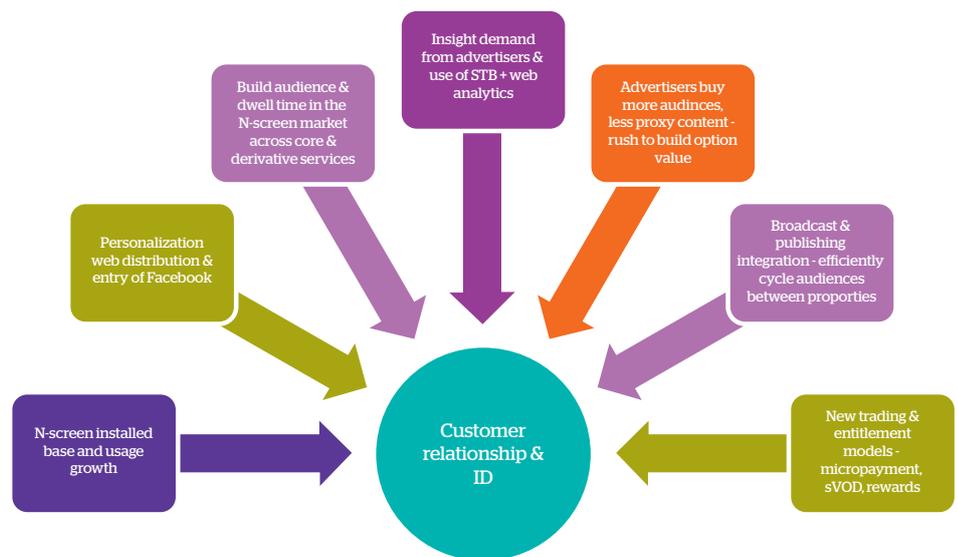
Video object recognition: reducing the need for metadata

In 2012 Google's X Lab built what it describes as a "neural network" of 16,000 computers with 1 billion connections and let it browse YouTube. What was it browsing for? Cats. Without knowing what cat is at the outset. The system learned to consistently identify cats and after 3 days could identify a cat in a video with 74.8% accuracy.

Such approaches using Artificial Intelligence to identify meaning in images promises a new frontier in image and video search and retrieval and makes existing approaches to metadata look vastly outdated. It also creates a challenge for broadcasters with large archives. Do they turn it over to Google and release value from the asset, or do they protect their video from the Google algorithm, retain control, but sacrifice traffic and hence value?

Whatever the strategic challenge, AI-led image search promises revolutionary new ways to manage and extract value from content, although we are long way from an algorithm being able to recognize and package content to the level of consistency that is necessary to meet the service quality and regulatory requirements of a broadcast license.

Figure 3: Customer Relationships in a Multiscreen World



Source: Ovum

New networking & distribution models to resolve the fixed and mobile capacity crunch

The shift of broadcast video to IP-delivered web services has far reaching implications for the commercial model, service model and architecture of premium video services. It will mean creative destruction on a wide scale, clearing ground for fascinating new services.

However it will also mean the transfer of traffic currently carried by digital terrestrial, cable and satellite networks to IP networks. Already the growth of video traffic is creating capacity challenges for fixed networks. As video traffic further grows it creates the threat of a coming **capacity crunch**.

If fixed and mobile IP networks are unable to deliver the capacity to support the video service experience expected by a growing number of end-users, it will force traffic prioritization decisions, based on commercial relationships between service provider and network access provider, or perceived criticality of the service. However it will render basic principles of net neutrality redundant. By definition, the access provider cannot be neutral if it having to prioritize one service over another.

Monolithic vs. distributed CDNs

Content Distribution Networks (CDN) will continue to enable network operators and content service providers manage the capacity overhead of moving video across IP networks. However today CDNs are largely proprietary. Efforts at standardization and federation have not taken off. Over time network operators are likely to move to a federated CDN model, while content service providers serving very large numbers of end-users will continue to invest in their own CDN infrastructure.

Has the time for information centric networking come?

The principles of Information-Centric Networking (ICN), formerly content-centric networking, have been around since the late 1970s. However as the Internet is used to move more and richer media content, introducing ICN capability to the contemporary architecture of the Internet becomes increasingly compelling. This would simply enable a user to request a piece of content, rather than access a physical device via an IP address, and also enable more efficient models of content storage, distribution and access. As computing moves further to the cloud and the physical location of compute and storage infrastructure becomes increasingly less relevant, this maybe a technology whose time is coming, if it can be integrated into existing architecture of the web with minimal cost.

P2P CDNs

Peer to Peer (P2P) networking is associated with content piracy. However P2P is also an efficient distributed content delivery method. Used by a number of video content service providers today, and in particular in China, the technology is increasingly mature. Challenges remain - not least the use of the end-users web connection to cache content in the background. However P2P clients present additional means to distribute high demand content.

Can LTE take the heat?

The 4G networks of today (also referred to as LTE - Long Term Evolution, the next generation mobile networking protocol) will be the main broadcast networks of tomorrow. Video traffic to smartphones and tablets will grow through a perfect storm of device growth, increase in on-demand and simulcast content availability and promotion of LTE networks as "video capable" by MNOs (mobile operators) looking to drive subscriptions and re-coup network investment. However this video traffic overhead will prove a capacity challenge for LTE. Solutions could range from content caching on device to caching technology at the base station. It will however drive another phase of investment in capacity off-load to WiFi.

Whitespace spectrum WiFi

The growth of video distribution to mobile device will drive the need for WiFi and the business case for further development in radio technologies that exploit geographically-specific patches of the un-used spectrum for unlicensed use. Whitespace WiFi has its challenges. It requires co-ordination between standardization organizations such as the IEEE, telecoms regulators such as the ITU, and it requires the administration of Geographic Information System (GIS) and spectrum availability databases to guide frequency usage. The business case for commercializing such a system will be driven by the growing demands on radio spectrum allocated to licensed cellular networks by video services.

The future for 3D?

Stereoscopic 3D is failing to find a market in the living room in its current form. Both consumers and broadcasters are switching off from the glasses-required model, and the announcements in mid-2013 that both the BBC and ESPN are terminating their experiments with 3D broadcasts is proof that as a mass-market proposition, at least for the moment, it is moribund. However, 3D is not dead. It is just not succeeding in its current definition and service model.

The power of an installed base of devices

The last three years have seen a large number of 3D televisions ship into the market. This will continue to create some incentive for live and non-live content producers to look to exploit this installed base and build 3D specific services, even though we can assume that they will remain only occasional-use services.

Moving 3D beyond stereoscopic limitations

Light-field capture technology is enabling still image capture devices to allow a user to focus an image after the image has been captured. This is a data and processor intensive activity just for stills and today this means that light-field capture technology for video is prohibitive. However over time these barriers will be eroded, and potentially we will see technology that will enable the user viewer to literally move around inside the video image.

Holographic 3D also allows the user to focus on a part of an image post capture and creates an alternative means to capture and manipulate image data. There are a small number of R&D projects exploring holographic capture technology and its potential applications. It presents an interesting new frontier for 3D video imagery.

4K/8K will happen as just another video resolution for capable devices

4K and 8K (ultra high definition resolutions) production technology is now coming to market, via television sets with 4K capability, the first experiments with 4K services are on the horizon and the industry is hoping to brand a combination of new high density resolutions as UltraHD. There is momentum behind this technology. Challenges will be the size of screen required to see value in this kind of resolution. However IP distribution, using efficient codecs such as HEVC (High Efficiency Video Coding), will help the video services market solve the traditional audience density challenge at deployment. Early adopters are geographically dispersed. 4K or 8K will happen, but just as another resolution for capable devices. The opportunity may prove to be at the screen-end of the value chain, with the ability to have a device with a pixel resolution that enables the audience to literally press their noses to the glass!

Moving beyond content service personalization, to personalization and end-user content control

Metadata, video search and service personalization create the potential for advanced content narrative multi-threading that can close the gap between what we understand as normal linear narrative filmed entertainment content today and immersive video games. Yes, audiences will continue to see value from participatory mass market events and the common shared experiences this creates, but that does not mean that the perspective of an individual or a social group on this event cannot be highly personal, creating enhanced derivative experiences. We are already seeing this model today in the way that highlights are presented and consumed by viewers of events such as the Olympic Games with **multiple simultaneous threads**. The same models can be applied to both live and non-live narratives.

This creates new possibilities to move beyond content service personalization to dynamic content narrative personalization, driven by either personal preference and past behavior or the aggregate behavior of a social graph.

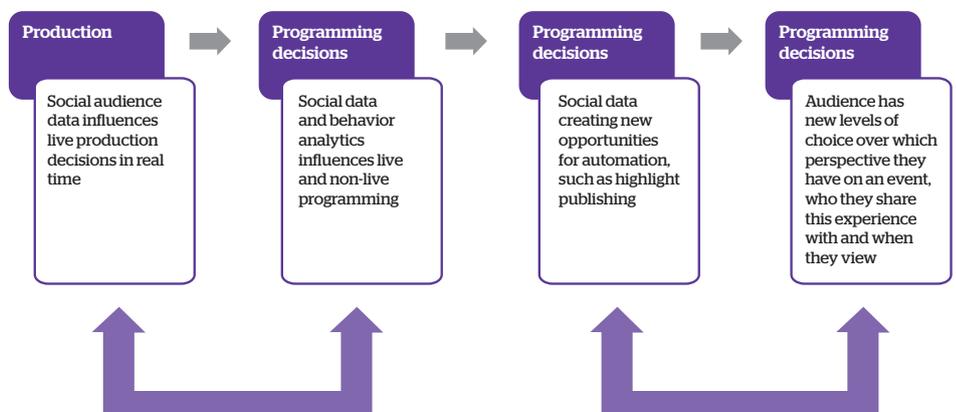
It also creates the possibilities of redefining a common shared media experience and making it specific to particular target segments or even social groups. The outcome of the drama or live event may be the same, but the journey to the conclusion may be specific to each viewer.

Gaming with live events

Imagine watching a Formula 1 race and then being able to pause the broadcast, pick up a games controller and be able to race a lap within a near photo-realistic games environment against the race leader. The potential of multi-threaded content, image processing, multi-angle scene capture and cloud gaming technology can deliver this experience.

Such technology (and the associated content production models) has the potential to create an entirely new content format, or at least

Figure 4: Content Personalization



Source: Ovum

enhanced experience of live or live content. Audiences can re-take the penalty kick, play the movie action sequence or participate in the quiz show.

As gaming becomes an increasingly important aspect of the global media market, technology, systems, platforms and production models that enable the delivery of a narrative live action product and an interactive immersive gaming product may become increasingly important to sustain the value of live action.

The use of social analytics and rise of social mass media

Content multi-threading creates the opportunity for social data to influence how programming is presented to the end-user. But we are already seeing the rise of social mass media. Audience

interaction with Twitter and Facebook is being exploited in live broadcasts. Social analytics is being used by schedulers and advertisers to gain further insight into audience profiles, beyond simple ratings data. Platforms serving both are incorporating social analytics. Already the wisdom of crowds is influencing not only broadcast services, but the entire video value chain.

Social data is also being used as a driver for automation, and specifically clip highlight publishing. Audiences are creating their own content services by virtue of their social response. Social mass media is here today. Media companies and audiences just have to decide how far to take it.

UGC, Consumerization and social interaction with video

The growing availability of video capture technology and web-based video editing and publishing platforms is democratizing the process of video production. What once would have required a professional video production team can now be done by a single individual armed with a smart phone.

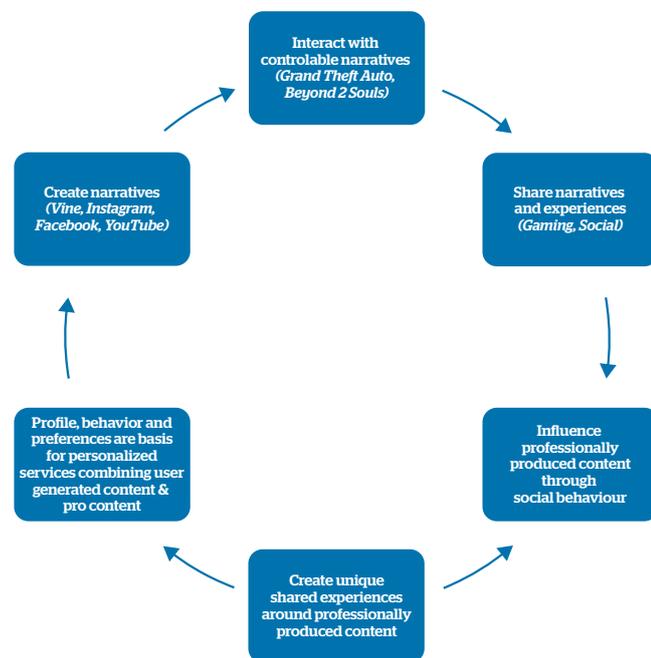
Video sharing platforms such as Vimeo and YouTube are largely dominated by User-Generated Content (UGC), and social video syndication on platforms such as Facebook and Twitter is just beginning to ramp up as video is integrated into these platforms.

Integrating UGC with professionally produced content

User-generated content has the power to augment professionally produced content. For example, integrating audience-generated media from live events can increase audience engagement. Alternatively communities of interest can and will generate media associated with specific topics, whether niche sports or even fan videos associated with specific products or brands. As brands and specialist digital publications increasingly look to program dedicated channels of content, blending user-generated programming and professionally produced programming will not only increase relevance, but also offer opportunities for marketing through the social graphs of contributing end-users.

As the distinction between professionally produced content and user generated content becomes blurred, the how, when, where of the content production becomes irrelevant. The value of the content becomes defined by the value to the individual in a particular context and therefore a content service can be a hybrid of dynamically assembled, professionally produced content and user-generated content. We are all broadcasters now.

Figure 5: Interactivity, Narratives and User Experience



Source: Ovum

The democratization of video production and publishing is creating new communication models. Video has major potential on both consumer and enterprise social networks as a method for individuals to communicate with large user groups. Any individual has the opportunity to become their own broadcaster, and there are millions of examples of successful user-generated channels on YouTube, Vimeo and other video publishing platforms. In this new world, the sole barriers to entry are an idea and basic production skills.

Google Glass is it at the very beginning of its market journey, but already it is demonstrating how it will create a wave of first person, user-generated content. Glass is already being used by media professionals with Vice Media recently demonstrating the game-changing power of Glass for ENG (Electronic News-Gathering).

While Glass services are limited today to basic data services, over time it will be able to support high quality video play back. This will make Glass a platform for the consumption of premium live and non-live entertainment. Glass will also be a platform for new, creative second screen services.

The coming marketing revolution

Ratings are changing. The availability of set top box data, click stream data and social data to supplement traditional panel-based measurement and augment the statistical validity of historical time series sample data is driving ratings providers, planners and buyers to explore new forms of measurement.

Dynamic content and ad targeting

Programmatic buying platforms and real time bid ad exchanges will make it possible for advertisers across all digital mediums to buy the audiences they want, not content as a proxy for audiences. It will also enable media investment at the level of the individual that is aligned against behavior, context and attribution in the context of customer lifecycle value. Big Data is already changing digital advertising and will change newly connected media markets. Television is the next market that will see the impact of real time bid media.

The targeting opportunities of a digital ad exchange however create a cost for television. Real Time Bidding (RTB) for television advertising will demand dynamic media that enable ads to be stitched together dynamically from a range of assets for the individual. The new challenge for ad creatives will be to preserve the purity of the common message of a creative execution, but incorporate dynamic elements that can enable the personalized experience of a common message.

In the long term, the fine grain level of targeting made possible by an RTB system should not only increase the return on marketing investment and reduce wastage, but also enable advertisers to more effectively use their attention capital with the end-user rather than bombard them with messages and risk negative brand exposure.

Native advertising for an evolving market

New digital media services and devices demand both publishers and advertisers define new formats that reflect the way that consumers actually use these devices and services. Mobile advertising is schooling the market that taking traditional PC-based ad units – and in particular banner ads – is not an optimal approach. Creating device-native customer experiences in the form of branded apps is a far more effective way to create the connection between consumer and brand.

As television evolves, this concept of device native advertising will also come to television. Already the market is seeing television advertisers are using sync'd second screen apps. And as the user interface models and on-demand service consumption models for the television also evolve, so advertising on this platform will also evolve.

Balancing use of data and creativity

Throughout this White Paper a theme has been the move to data-driven service personalization and commercial optimization. Broadcast advertising has much potential to be revolutionized by big data. However it will also illustrate the challenge of effective and appropriate use of data and targeting. Advertisers and programmers will have to learn how to exploit available data and use it to enhance, not replace creativity. This will demand new skills but create new opportunities for amazing new editorial and advertising content.

Show, don't tell - new forms of advertising

The digitization of customer interaction creates opportunities for brands to not just deliver ads – or “show” their products – but create new multi-platform digital experiences around their products that are integrated into the products themselves. Nike has shown how a marketing project such as Fuelband can change a company. Car manufacturers are creating new in-car experiences to create engagement with new customers via a mobile device. Digital media presents almost infinite possibilities for brands to create new experiences. In the long term, the task for publishers will be to create platforms on which brands can build these interactive experiences and they will be selling platform access - not just poster space.

The user data marketplace

Media creation and consumption is creating very large volumes of user data. This will open up new business models built around the concept of multi-sided markets. User data is traded today in user data exchanges such as BlueKai, as well as more conventionally through ad exchanges. Going forward, users will increasingly be able to explicitly grant access to their own data in exchange for enhanced services or price reductions. The key for content service providers looking to exploit this multi-sided model will be the extent to which there is an intermediary trusted by all parties, and this will require rigorous data security, transparency and process governance.

Solving the digital rights challenge

Dynamically generated content will make the digital rights supply chain exponentially more complex. Already traditional approaches to rights management are outmoded due to the move to on-demand media service models. As services become ever more personalized, media companies will have an ever-growing need to have a real time view of their available rights across any platform.

Today there are two challenges for effective rights management, one immediate but systemic and the other long term and institutional. The first is the lack of standardization of the taxonomy of rights, making the tracking of rights complex along the whole media supply chain. While there are a number of initiatives to encode rights information into standardized metadata formats, but unfortunately, the higher the value of the asset, the greater the need to monitor availability, but also the greater the probability that the rights contract will be un-standardized.

Copyright

However the deeper institutionalized problem is the very nature of copyright, as defined by national boundaries. In a digital world where the web transcends borders, copyright legislation defined against the printed word looks increasingly out of date. This White Paper is written for technologists, entrepreneurs and students, not lawyers and politicians. But it is the technology industry that is creating the need for revised legal frameworks, and it is the obligation of the technology industry to ask for these new legal frameworks.

Summary: The future media landscape

The future of media necessarily will be formed by the confluence of two seemingly opposite, but intimately related, trends of increasing personalization and increasingly shared experiences. Part of what enhances our personal experience is sharing it with others. We chat and share comments and content in social media, we influence the "personalized" recommendations for each other, we race against the professional Formula1 drivers but also against our friends in a video game. All of this creates an experience that is unique for each of us but built on sharing.

The question is not if these changes will happen; they already are. The question is rather how they will affect different stakeholders - the media industry, technology firms, viewers and consumers and advertisers.

What is clear is that the traditional lines are blurring - between the media industry and the technology industry, content producers and content consumers, between devices and

between forms of distribution, between passive and interactive content. The organizations that come out on top will be those which understand the nature of future media and the biggest winners will be those who can utilize or control the vast amount of information and insights that come from this convergence.

About Atos

Atos SE (Societas europaea) is an international information technology services company with 2012 annual revenue of EUR 8.8 billion and 77,100 employees in 52 countries. Serving a global client base, it delivers IT services in 3 domains, Consulting & Technology Services, Systems Integration and Managed Services & BPO, and transactional services through Worldline. With its deep technology expertise and industry knowledge, it works with clients across the following market sectors: Manufacturing, Retail & Services; Public sector, Healthcare & Transport; Financial Services; Telco, Media & Utilities.

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Ovum provides clients with independent and objective analysis that enables them to make better business and technology decisions. Our research draws upon over 400,000 interviews a year with business and technology, telecoms and sourcing decision-makers, giving Ovum and our clients unparalleled insight not only into business requirements but also the technology that organisations must support. Carrying out over 800 consulting and advisory engagements each year, Ovum has an enviable and hard-earned reputation as a provider of specialist consulting and advisory services. Our consulting customers tell us that, above all else, it is Ovum's industry knowledge, attention to detail and commitment to client success that sets us apart from our competitors.

We hope that this analysis will help you make informed and market-making business decisions. For more information about Ovum's consulting capabilities, please contact us directly at consulting@ovum.com.