DIGITAL TV EUROPE

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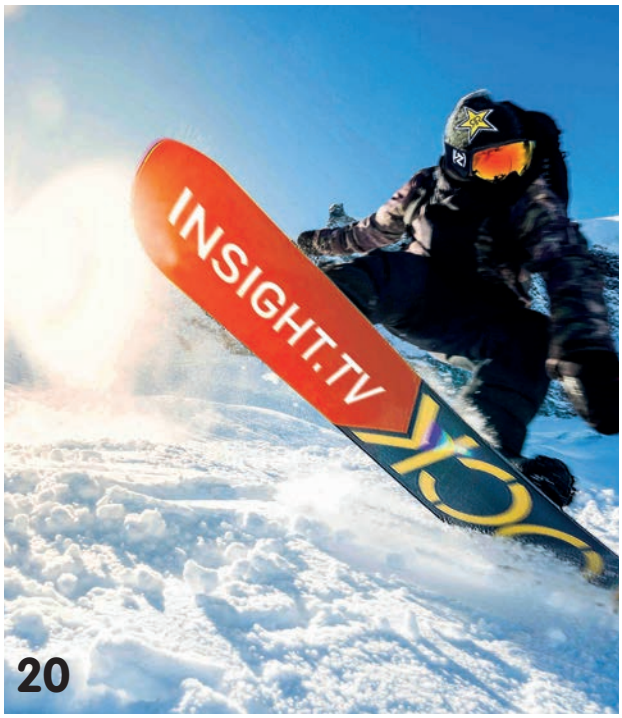

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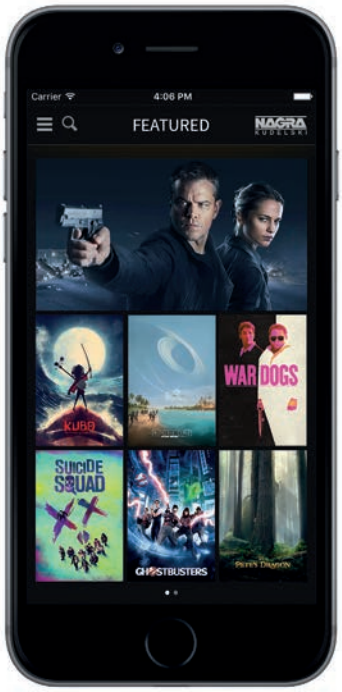

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Regulars

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Cable priorities

March is the month of Cable Congress, the European cable industry's annual get-together.

Cable remains the key distribution mechanism for TV in Europe but TV itself has become progressively less important to top-tier operators as a driver of growth in recent years.

As the video landscape has become more competitive, operators have focused on their key advantage – their network infrastructure – and on broadband access, which had delivered most of their growth. Cable TV numbers have been declining over the past decade as operators have turned their attention to marketing higher-value premium packages and advanced TV functionality and allowed analogue tiers to decline.

At the same time, broadband and, above all, the bundling of broadband, TV, fixed telephony and mobile, has delivered higher ARPU for cable operators.

In this issue of *Digital TV Europe*, we look at the top 10 issues facing the cable industry as they pivot to address high growth areas.

Delivering higher revenue from TV itself generally means more choice and more premium content. On the other hand, the business case for higher picture quality has proved elusive. It is not clear, for example, that 4K UHD TV will bring much in the way of additional revenue to TV operators, broadcasters and OTT TV players. But TV service providers are increasingly using UHD as a marketing tool to win over high-spending customers.

One danger associated with UHD however is that consumers may be disappointed or confused because the experience of viewing falls short of expectations.

In this issue, we take a look at the current and future state of UHD TV, encompassing the availability of content and services and the firming up of standards. The DVB's UHD-1 phase 2 spec is now complete but many questions remain over how fast broadcasters and manufacturers will develop UHD services. What are the key elements that will determine how fast the market takes off? To what extent are the technology stars now aligned and what remaining issues, if any, are likely to act as a brake on development?

With some studies predicting that half of all video consumption will be on mobile screens by 2020, video is something that mobile telcos as well as fixed line TV service providers are going to take seriously. Most mobile video consumption is via WiFi or download-to-go, but streaming over cellular networks is also likely to take some of the pie.

For mobile operators this raises a number of questions – both technical and in terms of their business model. Also in this issue of *Digital TV Europe*, we look at how mobile broadcast and live streaming technology is evolving and whether this is an urgently needed technology or a technology in search of a use case. ●

Stuart Thomson, Editor
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News digest

Höttges: Vodafone-Liberty Global deal 'completely unacceptable'

By Andy McDonald >

Deutsche Telekom CEO Timotheus Höttges has spoken out against a potential tie-up between Vodafone and Liberty Global-owned Unitymedia, branding it "completely unacceptable"

Speaking on the company's fourth quarter and full year earnings call, Höttges raised concerns about market concentration in the TV space and said that a combined Vodafone and Unitymedia would dominate the German market.

"I do not see that this kind of concentration in the cable market can be supported from regulatory bodies," he said. "I don't believe that Germany wants to go into a situation like Eastern European markets where TV markets are dominated by telco players."

Höttges said that Deutsche Telekom would protest the deal, if it is agreed.

Earlier this month Vodafone confirmed it was in early stage discussions with Liberty Global about potentially acquiring "overlapping continental European assets".

According to reports, the discussions are focused on Liberty's cable assets in Germany, though the two companies also have overlapping operations in the Czech Republic, Hungary and Romania.

Unitymedia is the country's second largest cable operator with some 13 million service subscribers as of September 2017. Vodafone is Germany's cable leader after it bought Kabel Deutschland in 2013.

Separately, Deutsche Telekom-owned T-Mobile Austria agreed to buy Liberty Global-owned UPC Austria late last year for an enterprise value of €1.9 billion.

During 2017 Deutsche Telekom grew its TV customer base by 9.0% in Germany and 4.8% in the rest of Europe.

In its home market, Deutsche Telekom's IPTV and satellite TV subscriber base climbed to 3.14 million at the end of 2017 – an increase of 260,000 from 2.88 million a year earlier.

Höttges: Deutsche Telekom will protest the deal if it's agreed.

In the rest of Europe its IPTV, satellite and cable TV base grew to 4.24 million – up 195,000 from 4.05 million a year earlier. The majority of these additions were at Deutsche Telekom's national companies in Hungary, Slovakia and Greece.

In Germany, the company said that it is focusing on marketing integrated offers and on TV and fibre-optic lines, due to the "persistently challenging development" in the fixed-network market, primarily owing to aggressive pricing offers of competitors.

"Our offer also includes attractive TV content across all screens – on any device. In Germany, for example, with Entertain TV, we aggregate linear television and the best streaming offers of our partners like Netflix or Maxdome on one platform," said Deutsche Telekom in its earnings statement.

"What's more, since 2017, the offer has included exclusive TV series such as *The Handmaid's Tale*, *Valkyrien*, and *Cardinal*, and our unique Telekom Sport offering."

The company said that it plans to continue to expand its content portfolio in the coming years – for instance through its international partnership with Netflix. It also said it plans to implement new operating concepts like voice control through smart speakers.

In other news, T-Mobile US announced the acquisition of online TV provider Layer3 TV in November, which closed on January 22, 2018.

Bulgaria

PROG > MTG sells Nova

Modern Times Group (MTG) has sold its 95% shareholding in Nova Broadcasting Group in Bulgaria in a deal that values the full business at €185 million (SEK 1.83 billion). MTG sold its Nova stake to PPF Group, the investment company controlled by Czech businessman Petr Kellner, with the deal forming part of MTG's ongoing transformation from a "traditional national broadcaster to a global digital entertainer". MTG said it will use the proceeds from the sale to invest in its digital entertainment business, as well as in its Nordic Entertainment and MTG Studios divisions – which it was due to sell to Danish telco TDC before the deal collapsed. Commercial media group Nova employs 650 people and the business consists of seven TV channels and 19 online businesses, which together generated SEK 991 million in sales and SEK 195 million in operating income for full-year 2017.

France

DTT > CSA 4K UHD TV plan

Media regulator the CSA has outlined plans to develop a new digital-terrestrial multiplex that will facilitate the launch of 4K UHD TV channels and other services. The multiplex will serve as an experimental platform for DTT broadcasters. The regulator envisages a launch by 2024 at the latest with coverage of at least 60% of the population of France. The watchdog said that it would work in partnership with operators and spectrum body the Agence Nationale des Fréquences to identify the resources necessary for the multiplex, while ensuring it would

have no impact on coverage of the country's existing six national multiplexes. The CSA said it would collaborate with broadcasters over the course of this year to identify the ideal coverage area, launch date and content line-up.

Poland

OTT > HBO on Ipla

Cyfrowy Polsat-owned OTT TV platform Ipla has added an HBO package to its offering as part of an overall revamp of the service that sees the launch of a new user interface. Ipla is now offering an HBO package comprising five channels. The service will offer HBO HD, HBO 2 HD, HBO 3 HD, Cinemax HD and Cinemas 2 HD along with four AXN channels – AXN HD, AXN Spin HD, AXN Black and AXN White. The package will also offer access to an on-demand catalogue of 5,000 titles. The HBO package will cost PLN35 (€8.40) a month.

Russia

IPTV > Pay TV growth slows

The number of subscribers to pay TV in Russia grew by 3.2% last year to 42.7 million, representing a penetration rate of 75%, according to research by TMT Consulting. Growth was driven by the big five operators, which collectively saw their pay TV bases rise by 1.5 million. This offset declines among smaller players, which collectively lost 130,000 subscribers over the year. The leading growth operators were Rostelecom, which added 600,000 customers, MTS , which grew primarily through the expansion of its satellite base, and ER-Telecom, which grew by acquiring Novosibirsk operator Novotelecom and Akado's networks in St Petersburg and Yekaterinburg. IPTV operators accounted for the bulk of the growth in subscribers, with 900,000 new customers signing up for IPTV services over the course of the year. Growth in the satellite segment increased year-on-year, which was attributed by TMT Consulting to MTS's active promotion of its satellite service. Satellite TV operators Tricolor TV and Orion Express grew their respective bases at a slower rate than previously, according to TMT Consulting. Tricolor TV remains the leading player in absolute numbers, with 12.28 million, up 1.2%, followed by Rostelecom with 9.77 million, up 4.9%. ER-Telecom takes third place, with 3.342 million TV customers after its acquisitions, up 12.1%.

Fries: Liberty Global will not 'dismantle' business

By Stuart Thomson >

Liberty Global has no intention of "dismantling" its European business and remains committed to growing its business in markets where it can achieve national scale, according to president and CEO Mike Fries. Speaking to analysts after the company reported mixed Q4 results, Fries said that Liberty remained committed to its core European markets.

The cable giant is in talks with Vodafone about possible disposals or exchanges of some assets, widely reported to include a possible disposal of its Unitymedia business in Germany, where Vodafone, as owner of former Kabel Deutschland, is the major cable player.

Liberty already operates a joint venture – VodafoneZiggo – with the mobile giant in the Netherlands.

Fries: national scale is the key to success.

"We are committed to our core markets, where we see a pathway to becoming a national champion," Fries told analysts. He said that "scale matters more than ever" in Liberty Global's business and the company would look to re-balance its business in certain territories.

Asked specifically about Liberty's intentions in the German and Swiss markets, Fries declined to give specific indications about the company's plans or negotiations with Vodafone. However, he said that in Germany the company had "optionality" but that Unitymedia was "a great business" that had proved to be "a home-run investment".

"We think we have a company that is continuing to grow steadily with a broadband market that's extremely exciting," he said. He said that it was "awkward" to be more specific about the company's plans but said that Liberty would either "grow with" the market or "look at options".

Regarding Swtizerland, Fries said that this was a market in need of "rationalisation" and that Liberty had "some options" to consolidate or "become a larger player". He said he did not expect a significant financial turnaround for Liberty's Swiss operation this year in the face of competitive challenges and the company's investment in sport rights, and compared Switzerland with the Dutch market where it took the company "three years to really get the fixed business...back on track".

Events

Cable Congress
Date: 6 - 7 March
Venue: Clayton Hotel, Dublin, Ireland
W: tmt.knect365.com/cable-congress

DVB World
Date: 12 - 14 March
Venue: Intercontinental Warsaw Hotel, Warsaw, Poland
W: www.dvbworld.org

Satellite 2018
Date: 12 - 15 March
Venue: Walter E Washington Convention Ctr, Wash. DC, US
W: 2018.satshow.com

Sportel Asia
Date: 13 - 15 March
Venue: Shangri-La Hotel, Singapore
W: www.sportelasia.com

NAB Show
Date: 7 - 12 April
Venue: Las Vegas Convention Center, Las Vegas, Nevada, US
W: www.nabshow.com

MIP TV
Date: 9 - 12 April
Venue: Palais des Festivals, Cannes, France
W: www.miptv.com

TV Connect
Date: 9 - 10 May
Venue: Olympia, London, UK
W: tmt.knect365.com/tv-connect/

New Europe Market
Date: 11 - 14 June
Venue: Dubrovnik, Croatia
W: neumarket.com

ANGA COM
Date: 12 - 14 June
Venue: Cologne, Germany
W: www.angacom.de

Global Wrap

There are now 125 million subscription video-on-demand subscriptions in the US, according to **Futuresource**. The research firm said that while consumer spend on SVOD is still just 10% of the total pay TV market, further growth is expected in 2018. **21st Century Fox** is to launch a standalone Fox News opinion-focused US streaming service. **Fox Nation** is expected to launch in the fourth quarter of the year. **Verizon** has folded its US video streaming service, **Go90**, into its Oath division, in a move that see Go90 content distributed through its other digital channels. **BBC Worldwide** has signed a deal with **Migu Video**, China Mobile's video platform that will deliver more than 2,200 hours of BBC content from across factual, lifestyle and pre-school genres. The deal with Migu Video marks Worldwide's first deal with a Chinese telco. **Canal+** has officially launched its service in Myanmar, in partnership with local media player **Forever**. The new service offers close to 80 channels covering a range of genres, including eight Canal+-branded channels developed specifically for the local market. Chinese internet search giant **Baidu** is planning a possible IPO for its video streaming unit **iQiyi** in the US. Baidu has yet to determine the number of shares to be sold and added that planned to remain iQiyi's controlling shareholder. **Liberty Latin America** has acquired an 80% stake in Costa Rica cable operator **Cabletica**. The all-cash deal values **Televisora de Costa Rica**-owned Cabletica at CRC143 billion (€200 million), a multiple of 6.3 times its 2017 EBITDA.

South Africa

OTT > Kwesé into Iflix

Econoet Media-owned pan-African pay TV provider Kwesé has acquired a "significant stake" in Iflix Africa, the African branch of the Asian subscription video-on-demand provider. The deal deepens the two companies' existing partnership, with Kwesé and Iflix first partnering in August to launch a version of the latter's emerging markets SVOD service in sub-Saharan Africa. Iflix now has operations in Nigeria, Kenya, Ghana and South Africa, and claims an "extensive collection" local African and international series and movies – including some first-to-market and exclusive programming. Kwesé said that Iflix Africa will be its "core vehicle" for delivering mobile experiences to millions of viewers in Africa, with both companies having already committed "extensive resources" to the offering. Terms of the deal were not disclosed.

Spain

IPTV > Pay TV growth

The number of pay TV subscribers in Spain increased by 6.6% in the year to September 2017, taking the total to 6.4 million, according to statistics compiled by markets regulator the CNMC. Growth was driven by the success of bundled offerings. The number of quadruple and quintuple-play packages sold increased by one million in the year to September, taking the total to 11.5 million, including 5.3 million quintuple-play packages. The number of IPTV subscribers in the country reached 3.8 million, consolidating IPTV's lead over other technology platforms. IPTV platforms added 464,000 subscribers over the year, compared with a decline of 141,000 satellite subscribers. The number of installed high-speed broadband lines in the country meanwhile grew to 9.2 million, up 20.6%. Fibre-to-the-home deployments accounted for the bulk of additions, with 1.6 million new connections taking the number of fibre connections to over six million. Overall, there were 6.1 million FTTH connections, compared with 5.4 million xDSL lines and 2.6 million HFC connections at the end of September. Some 8.9 million broadband connections delivered speeds in excess of 30Mbps by the end of the third quarter, with five million delivering speeds in excess of 100Mbps.

Telefónica claims success for originals strategy

By Stuart Thomson >

Telefónica claimed success for its original content strategy in its full-year 2017 results, with strong growth of its TV platform in Spain and a ratings success for flagship drama series *La Peste*.

Telefónica's video revenues grew by 7% in the fourth quarter of 2017 and by 5.8% for the full year on the back of a 14% growth in its IPTV base and its investment in content, the company said. Video ARPU grew by 8% across all market while churn fell marginally.

Telefónica's global pay TV base grew by 2% over the course of 2017 to 8.468 million, boosted by the addition of 92,000 customers in the fourth quarter compared with a net loss of 108,000 in the fourth quarter of 2016. The company said that its commitment to TV as

a differentiator had resulted in continuous improvement to its Movistar Play offering.

In Spain, Telefónica added 400,000 new customers over the course of the year, with growing take-up of its bundled offering Movistar Fusión. The company said that it had 4.4 million Fusión customers at the end of the year, with 87% penetration of its TV base. Conversely, some 76% of Fusión customers took TV as part of their bundle, up from 68% last year.

Overall, Telefónica's Spanish TV base stood at 3.8 million at the end of the year, up 5% year-on-year, having added 81,000 customers in the fourth quarter. The TV number was boosted by the presence of TV in all bundled offerings. According to the company, its decision to invest in original productions such as flagship drama *La Peste* "yielded very positive results". It said that *La Peste*, largely viewed on-demand, registered the largest audience of any series broadcast by Movistar+ to date.

Elsewhere in Telefónica's global footprint the picture was mixed. In Brazil, where the company is focusing on IPTV rather than satellite, its pay TV base declined by 7% but TV ARPU grew by 6.1%.

In Spanish-speaking America, the TV base grew by 4%, with net gains of 41,000 in the fourth quarter boosting the annual total of 113,000 net additions, driven by strong uptake in Peru. Pay TV revenues grew by 12.8%.

Q&A: Edwige Dazogbo, Edgy TV

Edwige Dazogbo, founder of Edwige Magazine and Edgy TV, talks about the international expansion of the multi-ethnic themed lifestyle channel.

How do you rate Edgy TV's success since its launch, both in Canada and internationally?

Our multicultural, new media offering has international potential. We saw growth of 200% in terms of our TV viewership following the first launch of the channel on one operator in December – with distribution on three other cable or IPTV operators in Europe, on smart TV in the US and two satellite launches in just three months. There is a demand in Canada and in the international market because of the multicultural themes of the channel.

Through our cooperation with various networks, we have reached some of the major companies worldwide that want to work with us, so we are starting to have success. Furthermore we had a number of mentions highlighting the existence of the channel in the media, and we have worked together with advertising agencies to support sales, as well as adding more and more hours of interesting content to the channel and producing new content in Canada.

What are your goals for the channel this year in international markets?

We want to join together different cultures' diverse ideas of beauty, culture and fashion. We want to create unique content, and we intend to cater to the interests of the multi-ethnic market. The channel allows our advertisers to reach an international community.

This year we aim to launch the channel in the countries we have targeted: the US, Canada, France, Belgium, Luxembourg, Switzerland, Poland, the UK, Germany, Spain, the UAE, China, India, Pakistan, Israel, Tunisia, Benin, Senegal, Cameroon, Congo, Mali, Burkina Faso, Reunion, Mexico, Colombia and Brazil. We also aim to launch sub-brands of Edgy TV: Edgy TV Music, Edgy TV France, Edgy TV India and Edgy TV Africa.

What is your distribution strategy for the channel, in terms of OTT versus affiliation with pay TV operators, and to what extent are you focusing on French-language markets?

We started with cable and IPTV and we want to grow the presence of Edgy TV both online on OTT TV, on IPTV platforms and via apps as well as broadcast on cable pay TV platforms and satellite free-to-air, with a goal of reaching more than 200 millions of viewers in total.

Our strategy is simple and successful. We have a vision and goal to become a major popular channel in the French-language market.

What is the channel's mission and what makes it unique in the female-focused lifestyle space?

The mission is to cover the interests of the multi-ethnic market with a multicultural TV channel that celebrates the diversity of life through lifestyle: glamour, music, fashion and entertainment. It has been created specially for immigrants from Asia, Africa, Latin America and the West Indies, Europe, the Maghreb and the Middle East.

Edgy TV offers a unique original concept and refreshing programming, made purely from dreams and passions. This is content that is rare among TV content providers in the market in countries in Africa, Europe, the Middle East and Asia.

Family and spiritual values underpin the spirit of Edgy TV. We are re-introducing this culture and these values to the world.

What do you see as the ideal balance between global and local content, and to what extent will you seek to localise the channel in international markets?

Our content is the final product of our big international vision, and includes 70% external acquisitions, with the other 30% coming from our own local productions in France, Canada and the US.

There will be general-interest programmes, music video programmes, fashion clips, films from Nollywood, Hollywood and Bollywood and other ethnic-background movies, shows featuring interviews with celebrity guests, and reality shows.

We are addressing a market that is not yet saturated and where there is a strong international demand for multicultural-themed programming. This is a market with a high growth potential in many parts of the world.

Sweden

OTT > Viaplay viewing up

Nordic subscription video-on-demand service Viaplay saw viewing time increase by 25% during 2017, according to stats released by parent company MTG. Customers spent an average of 32 hours per month streaming Viaplay last year, while the number of started streams rose 40.5% between 2016 and 2017. Over the same period, MTG said the total number of Viaplay customers grew by 21%, with Viaplay original productions among most viewed new series in each Nordic country in 2017. Among Viaplay's original output, *Hassel* was the service's most-watched new series in Sweden and Finland; *Veni Vidi Vici* was the second most-watched new-series in Demark; and *Occupied* season two was the second most-watched new series in Norway. Overall eight Viaplay original productions premiered during 2017. MTG said that Viaplay also streamed 50,000 hours of live sport in 2017, including Premier League and UEFA Champions League football. In terms of viewing habits, MTG said that viewing on TVs or projectors surpassed mobile devices for the first time since Viaplay launched in 2011, with a user base of 64% on those devices compared to 61% for mobile as of December.

UAE

OTT > Nick Jr Play launches

Netflix has agreed its first partnership in the Middle East and North Africa with local operator OSN. OSN customers will be able to access Netflix's content via OSN's new set-top box, which is due to launch towards the end of the second quarter. They will also have the option to pay for their Netflix subscription along with their OSN package as part of a single, consolidated bill.

UK

OTT > Nick Jr Play launches

Viacom-owned kids channel Nickelodeon has launched Nick Jr Play, its interactive app aimed at pre-schoolers, outside the US for the first time. The app, which includes access to Nick Jr. shows, games and music, is now available in the UK and Denmark, with other international markets to follow. The app will provide access to full episodes, educational games, original videos and other content. In Denmark, the app will be available via mobile through partnership with YouSee.

Richard: Orange will not take part in future French consolidation

By Stuart Thomson >

Orange will not participate in any future consolidation of the French multi-play telco business, according to CEO Stéphane Richard, despite ongoing speculation about the future of Altice France/SFR.

Speaking to analysts after the company posted strong full-year results, Richard said that Orange would not play a role in any future combination except "to facilitate it" and would not revive anything akin to its previous abortive move to acquire Bouygues Telecom.

"There is no hidden agenda and no hidden project anywhere," he said. "There is no project that makes sense for us today."

Richard was responding to a question that referenced rival service provider Altice, under pressure since last year due to concerns about its indebtedness following poor Q3 results. Altice announced a major reorganization of its operations including a spin-off of its US assets in January.

Richard: Orange will not be a consolidator in France

Altice recently condemned a report by the right-wing weekly *Valeurs Actuelles* that it was considering a sale of all or part of SFR, leading the publication to publish a retraction.

Richard said he did "not know" if there would be a development relating to Altice in the coming months, but that "Orange will not play a front role in any type of consolidation scheme".

He said that Orange's talks with Bouygues a couple of years ago had been engaged because the deal "was outstandingly value creative". He said that there was no kind of operation today "in which we could play a leading role". Orange and Bouygues had diverged and there was no chance of that deal being revived, he said.

"We cannot buy SFR and we cannot buy Free, which is in any case not for sale," he said. Any consolidation would involve two of the other players. He said consolidation still made sense because France was one of the only markets in Europe with four players, which was probably "not a sustainable situation in the long run".

Richard said Orange could "help facilitate" consolidation but would not participate in it. The inference from this is that Orange could acquire certain assets that may be disposed by merging parties to secure regulatory approval for a deal.

Referring to negotiations with Altice to carry its pay TV channels, Richard said Orange had decided it would be a positive move to take Altice's pay TV services in order to allow customers "to benefit from all possible content that matters to them, and sport including the Champions League is clearly an attractive content for our customers".

He said if Orange could strike acceptable terms with Altice it would take its services. In non-sport genres, he said, Orange had attractive content through its own OCS offering and its deal with Canal+ and "did not need anything else". However, in sports, Altice's grip on Champions League rights meant that a deal was desirable.

"I don't know if we will get a deal or not – it's an ongoing discussion," he said.

Orange had 9.065 million TV customers globally at the end of the year, up from 8.483 million a year earlier. The company had reported 8.92 million TV customers at the end of previous quarter.

In France, Orange had 6.861 million TV customers, up from 6.609 million a year earlier, with a modest gain in the fourth quarter from the 6.84 million reported at the end of September.

Richard said there would be "substantial renewal" of Orange's management team after his leadership mandate is renewed. He wants "more non-French" people, "more women" and "more operational people". The new team will be unveiled at the end of March.

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THE CABLE TOP TEN

What are the key industry developments shaping the future of cable? Ahead of this year's Cable Congress in Dublin, *Digital TV Europe* presents its take on the top 10 priorities for the industry.

The need for scale

For cable operators seeking to rival telecom players in scale and compete at national – or international – level, the most obvious route is to buy other operators' networks. Indeed, acquisitions have historically been the preferred way to expand for major players such as Liberty Global, Vodafone or Altice.

Consolidation of the cable industry has progressed over the years in some markets and less so in others. While the UK and France have one operator each, the industry in much of central and eastern Europe remains highly fragmented.

While players such as Altice, Deutsche Telekom, Telekom Austria and TDC – and more recently, Sweden's Tele2 with its planned acquisition of Com Hem – have built a mix of telecom and cable assets, Liberty Global and Vodafone have been the major players in consolidating the European cable business in recent years and there has been on-and-off speculation about them taking the biggest step of all towards pan-European cable consolidation by merging with each other. The pair are currently engaged in talks related to specific territories, notably Germany, where both have cable assets and Liberty Global is the smaller player.

The groundwork for collaboration between the pair has been set by the pair's VodafoneZiggo JV in the Netherlands, which represents a different direction for M&A – namely the convergence of fixed and mobile networks, which also underpins the Tele2/Com Hem tie-up, a move that was likely driven by common shareholder Kinnevik, which has committed to not sell its shares in either company for at least six months after the deal is completed. Other fixed-mobile mergers include Belgian operator Telenet's acquisition of BASE and SFR BeLux.

"In terms of M&A we will see more fixed-mobile convergence mergers between mobile and fixed broadband providers," says Maria Rua Aguete, executive director, technology, media and telecom at IHS Markit. "These mergers are often motivated by the desire to offer integrated solutions, consisting of fixed broadband and telephony, pay TV and mobile services. Quad play is critical to retain customers and achieve growth, hence the intense M&A activity between telcos and cable operators."

A broader tie-up between Liberty, which this year split off its Latin American interests and agreed the sale of UPC Austria to T-Mobile, and Vodafone remains the most obvious large-scale merger play in European cable and still makes sense to many industry observers. Liberty is, however, continuing to make moves to focus on markets where it can realistically build a large-scale operation that can compete with telecom players. It is trying to expand its base in Poland – by acquiring Multimedia Polska – while selling off in Austria, where it has a relatively small reach.

Other moves to consolidate are taking place. Last year Basque Country-based Euskaltel acquired Zegona Communications-owned Telecable, another regional operator in northern Spain. Euskaltel also announced plans to expand its reach in adjacent Spanish regions by using third-party infrastructure. IHS's Rua Aguete believes that the most likely long-term outcome in Spain is the acquisition of the northern Spanish player by Vodafone, which, through its ownership of the former ONO, is already the country's major cable operator.

At the other end of Europe, Finland's Elisa acquired Estonian cable operator Starman. In between, Germany's Tele Columbus has built itself into a more considerable player by acquiring Primacom and Pepcom.

Despite this flurry of activity, the overall pace of consolidation between European cable players remains relatively slow, perhaps indicating that bargains are hard to find. This has probably contributed to some operators turning to an alternative way of achieving scale – building out their networks into greenfield areas.

Investing in the network

The network has always been the cable industry's biggest asset, with the hybrid fibre-coaxial (HFC) infrastructure planted in the ground decades ago giving cable players a major advantage over telecom operator rivals forced to build out expensive fibre-to-the-home or rely on other technologies that historically have been less able to deliver ultra-fast services to consumers.

The quality of cable networks is nevertheless uneven and cable's technical reach is limited compared with that of incumbent telcos. Operators have therefore continued to invest in upgrading out-of-date plant to deliver high-speed services. However, the cost is lower than planting fibre in the ground from scratch, which has remained a key advantage for cable operators – which generally have access to more limited financial resources than big telcos.

Operators with access to sufficient resources such as Liberty Global have also sought to expand their footprint by building out both HFC and fibre networks to greenfield areas, a strategy that has been aided by technological advances that have reduced the costs, helping to make build-out strategies a feasible alternative to acquisition of other operators, which, conversely, has become more expensive.

According to Cornel Ciocirlan, chief technology officer, Europe at cable technology provider Arris, cable operators are not only seeking to make the most of their existing HFC infrastructure but are in some cases actively building out HFC rather than FTTH to new-build areas. "We still see HFC being actively built – operators are building new HFC plant. They have a choice, and all being equal they will build out fibre. But all is not always equal. The cost of an HFC home is much less, and from a capex perspective operators want to make every dollar or euro count," he says.

In fact, says Ciocirlan, operators are using a mix of technologies in new-build areas. They are often collaborating with housing associations and builders who require fibre as a marketing tool. Operators are sometimes using the RF-over-glass (RFoG) technology that enables them to maintain a single service delivery platform across both HFC and fibre networks.

Speaking at the UBS Annual Global Media and Communications conference at the end of last year, Liberty Global president and CEO Mike Fries said that new build of network in areas where it does not already have a presence is a key growth opportunity for the operator, which was "hitting the marks" in terms of the targets the company has set. He said Project Lightning – the name of the company's network build-out in the UK – was delivering in terms of costs and rising revenues. "Lightning is doing everything we asked it to do," he said.

Crucially, said Fries, Liberty was focused on "long term enduring growth" rather than short-term cash flow, which is why it is investing in new network areas.

Operators with more limited resources and scale than Liberty Global also know that extending their reach is crucial to competing effectively with better-resourced telcos. In a number of markets with fragmented cable infrastructures mid-sized operators have sought to forge partnerships with smaller local players to offer their services across the local network in arrangements that fall short of outright acquisition.

In their existing network footprint, meanwhile, operators are seeking to reclaim bandwidth in order to offer higher-speed broadband service to compete more effectively with rival providers. This trend both fuels and has been fuelled by cable losing TV subscribers to IPTV and satellite, while gaining new broadband customers. Many operators have now moved to shut down analogue services, losing some legacy customers but enabling them to focus on higher-paying bundled offerings. The ultimate goal is to deliver TV through IP, but the presence in the network of legacy RF set-top boxes still acts as a brake on this.

3 Multiplay bundling

Bundling TV, broadband, and telephony has for years been a competitive way to upsell existing subscribers to new products, and convergence remains a strong strategy for European service providers today.

In February of this year, Vodafone confirmed that it was in early stage discussions with Liberty Global about potentially acquiring "overlapping continental European assets". According to reports, the discussions were focused on Liberty's cable assets in Germany, which are run by Unitymedia – the country's second largest cable operator. Vodafone is already Germany's cable leader following its acquisition of Kabel Deutschland in 2013.

Speaking at the UBS Annual Global Media and Communications conference in December, Liberty CEO Mike Fries commented that "national scale is what matters in Europe" and said Liberty would be a "buyer or a seller" in markets where it lacked scale. Shortly after T-Mobile Austria agreed to buy Liberty Global-owned cable operator UPC Austria for an enterprise value of €1.9 billion, transforming it in the process from a mobile to a quad-play provider.

Speaking on Liberty's recent fourth quarter earnings call, Fries said that he has no intention of dismantling the company's European business and stressed that he remains committed to growing its business in markets where it can achieve national scale.

This latest burst of activity is the latest in a long line of similar deals in the European market. In January Swedish telco Tele2 agreed to buy local cable operator Com Hem in a merger agreement that will establish Tele2 as a major integrated mobile and fixed line operator. A year earlier Liberty and Vodafone completed the creation of their Dutch joint venture, establishing a converged fixed and mobile communications operator to compete with KPN. In early 2016, meanwhile, BT closed its £12.5 billion (€16.7 billion) buyout of UK mobile operator EE to make its mark on the quad-play market.

While more deals of this type look likely to follow, it is worth considering that the future of bundling is likely to go beyond just offering TV, internet and phone services. "I expect the traditional triple and quad-play bundled strategies to continue in tandem with

ABOX42

Q&A: Oliver Soellner, ABOX42

Oliver Soellner, member of the management board at ABOX42, talks about the advantages of turnkey solutions for TV service providers.

What are the main challenges facing telecom operators in launching TV services and keeping them up-to-date?

The TV market is developing very fast nowadays, so there is a constant need to innovate and keep up with the latest developments, always a need to observe the latest technologies and trends on the market. This is quite new for traditional operators (e.g. cable operators) who are not used to acting agile and keeping up with the market and competitors, since in the past TV services were mainly linear, without much interactivity.

Today there are many new possibilities in terms of features and services (network PVR, restart TV, on-demand services, OTT services), which requires a much more flexible TV solution including a strong set-top box platform to be able to introduce new features over time and keep up with technology trends.

What are the main technology innovations that are changing the way IPTV systems are implemented and what impact will they have?

Looking at recent technology innovations, UHD/4K seems to be a main driver for change these days. UHD/4K requires changes in the complete content delivery system, starting with the introduction of H.265/HEVC for more efficient content distribution and enhanced content security requested by content owners. These technology changes have an impact on the whole production and delivery system (production equipment, encoding, transcoding, streaming and end-user devices such as the operator set-top box). Such change needs solid planning and has quite an impact on operator TV solutions.

Apart from UHD/4K we see a major trend on the operator side to provide comprehensive multiscreen services on multiple devices, which also allow interactions between mobile devices and the set-top box e.g. for content discovery on mobile, playback on TV, essential control functions as well as remote programming of recordings.

Due to the fact that infrastructure is evolving fast and operators are able to offer decent broadband connections on DSL and fibre, more and more end-customers are getting access to new IPTV and hybrid solutions.

What are the main advantages for operators in choosing a turnkey IPTV system as against developing a platform using multiple suppliers?

Choosing a system from a trusted partner means choosing a solution from someone who is a specialist in his field. It is easier, faster and cheaper to rely on the trusted technologies of a turnkey IPTV solution than investing lots of time and money in operators' own developments and investigations.

Next to cost, a turnkey solution reduces the overall project complexity for the operator, allows the operator to grow seamlessly and benefit from a steady evolvement of features and functions.

Last but not least a turnkey solution takes away a lot of hassle from operators maintaining the solution including all applications, which requires steady development to maintain compatibility of all apps (e.g. iOS, Android, Windows).

To what extent are turnkey solutions more suited to the needs of small and medium-sized operators, and to what extent are larger players likely to go down this route?

We have seen a clear trend for a couple of years already towards white label multiscreen IPTV and hybrid solutions, and not only with smaller/ medium size operators who could not handle a complex project and do not have the budget for it.

Even larger operators are increasingly considering hosted and managed solutions, since the history shows that many operators struggled with their legacy solutions by managing a complex project in-house, which has a lot of room for failure and requires quite a strong in-house product management and organisation with various stakeholders.

With a turnkey solution the project complexity is much reduced, which allows the operator to focus on his major strength in marketing and sales.

How much flexibility does a turnkey offering give to service providers to differentiate the user experience and their overall offering?

In the past one of the arguments of larger operators made against white label/ turnkey solutions was that these solutions do not offer enough customisation possibility. Today, this is also becoming less of an issue, since most modern TV middleware solutions are browser-based and do offer a high level of flexibility for customisation and UI changes to achieve a unique user experience across all screens, while still leveraging the advantages of a white label/turnkey solution.

the growth of more 'evolved' bundles that may include newer OTT elements but will also comprise different mixes of the traditional service components," says Jonathan Doran, principal analyst at Ovum and an expert in telco video and pay TV operator strategies.

"We can expect more operators to drop fixed line rental, while some will cater for cord-shavers and cord-nevers with dual offerings based around fixed and mobile broadband but without the enforced pay TV component. Bundling options will become increasingly modular so that, for example, there is a base of single or dual-play broadband, with the choice to add pay TV or online video: a kind of semi-a la carte scenario."

Next-gen TV

In an increasingly competitive content landscape, user experience is arguably becoming a key point of differentiation among operators. But to what extent do advanced TV features and set-top box developments matter to customers?

In its most recent earnings announcement, Liberty Global said that in Q4 2017 it added 210,000 subscribers to its advanced TV platforms – Horizon, Horizon Lite, TiVo, Virgin TV V6 and Yelo TV. The additions still only took its advanced TV total to 43% of its total cable video base, but was a significant positive in a quarter where its overall video customer number dropped by 54,500.

Liberty-owned UK operator Virgin Media announced in January that it would offer customers a free upgrade to its high-end V6 set-top box – in what it described as one of the largest customer upgrade programmes ever carried out in the UK. Virgin Media said that by the end of the year it expects the majority of its TV customers to have a V6 box – a premium, 4K-ready device that allows users to record up to six programmes while watching a seventh recording or stream.

Pushing TV customers to their latest and most impressive TV experience makes sense for operators in today's hyper-competitive media landscape. Virgin Media claims that V6 customers spend on average two hours longer each week watching TV and are more than twice as likely to watch a box set – an important factor when research shows that linear TV viewing is down overall as the popularity of on-demand platforms increases.

"As consumer expectations keep rising and differentiation based on content alone is likely to become more challenging in most markets, UX is one of the key factors that consumers will consider when choosing a multi-play operator," says Simon Trudelle, senior director, product marketing at Nagra.

The content protection and multiscreen television solutions company works with cable customers around the world – including Altice Group, Net Serviços and StarHub – which have deployed Nagra UX solutions to introduce new on-demand and multiscreen features and capabilities.

"From easily providing access to on-demand content, including start-over, catch-up TV and cloud DVR, to onboarding OTT apps like Netflix, or providing linear channels delivered to any screens, our customers have successfully evolved their platforms to provide more convenience and better access to content for their subscribers," says Trudelle.

With much set-top box functionality moving to the cloud, it is important that operator-provided devices integrate new capabilities like personalisation, voice recognition, and smartphone-based remote controls and video casting, while also providing access to OTT app stores.

"There is an innovation gap building up in the industry, and there is a real risk for cable operators in particular – especially the mid and small-size ones in Europe and elsewhere," warns Trudelle. He claims that distributing a bundle of linear channels is "simply not sufficient anymore to guarantee TV revenues", with younger viewers in particular increasingly deciding to access TV and video services through OTT players. He suggests that while incumbent cable operators need to evolve legacy infrastructure, they should take a cloud platform approach to compete with fast-moving over-the-top competitors.

Investing in content

Investing in content is one way to differentiate a pay TV offering. But what content works best and is this always the right approach for an operator to take?

Premium sports rights have long been a major draw for viewers and a key investment for pay TV operators. While major online video giants like Netflix and Amazon have – for the time being at least – focused their efforts around scripted content, live sport remains an important reason for choosing and remaining committed to a pay TV operator.

Another battleground that is of increasing importance, at least for

some operators, is high-end drama.

In Spain, Telefónica has invested €70 in Movistar+ original productions and it recently announced plans to launch these series in 12 countries across central and south America – airing them on a new Movistar Series channel and across its Movistar TV and Movistar Play platforms.

Elsewhere, Liberty Global recently announced its second move into original drama, partnering with All3Media International and Amazon Prime Video to produce *The Feed* – a London-based series, set in the near-future.

Sky, meanwhile, said on its most recent earnings call that viewing of Sky channels had increased by 6% following both critical successes and record audiences for Sky Original productions like *Riviera* and *Tin Star*.

Ed Border, principal analyst, Ampere Analysis, says that pay TV operators can market themselves via a mix of two things – convenience or exclusivity.

Cost-effectively bundling channels and services that are available elsewhere, with something like a broadband package, is an example of value through convenience. Exclusivity, on the other hand, is important but does not necessarily need to be achieved through direct content production. This can also be offered through licensing deals – such as Sky's deal to offer HBO content in the UK through Sky Atlantic.

Of the many larger operator-broadcasters that do effectively invest in original content, Border says the choice comes down to whether they should produce or commission new genres – for instance comedy – and how to brand this original content.

"In some ways, for these large broadcasters, the rise of Netflix can be slightly beneficial – as they can commission local content, for which they own the rights in their own markets, and then sell the rights for other global markets to an international platform," says Border.

"Such deals – in which global SVOD platforms obtain near-global exclusive rights to a piece of content and market it as an 'original' – are becoming increasingly common."

"For smaller cable and pay TV operators, providing more niche or localised service and content, originals become less important. These services are often picked up by consumers alongside an SVOD platform or subscribed to for their local or specialised content. It is therefore more important that these platforms provide carefully curated in-demand content, rather than major originals."

For general operators looking at TV seasons, Border claims it comes down to optimising choice based on local tastes. For example, Turkish viewers have a preference for long-form TV seasons with long episode times, South Korea has a steady flow of one-off, short drama seasons, while in South America long-running telenovelas are key.

Embracing OTT

Virgin Media in the UK was the first pay TV operator to let Netflix on its platform back in 2013. The cable provider initially offered the service to a limited number of homes on its Virgin Media TiVo boxes, before rolling it out to all TiVo customers. Com Hem was Netflix's second cable provider partner, with the Swedish operator launching it on its TiVo based platform the same year.

Since then the subscription video-on-demand service has expanded to pay TV platforms all around the world. The first US cable operators to take up the service were RCN Telecom Services, Atlantic Broadband and Grande Communications in 2014, followed closely by Suddenlink. While the biggest US cable providers took longer to take to the idea, Comcast launched Netflix to X1 customers in 2016, while Charter and then Cox integrated the service in 2017.

In Europe, Liberty Global's decision to embrace the service in 2016 was a major watershed moment. As part of a multi-year deal, the operator pledged to make Netflix's content available to its subscribers in 30 countries around the world.

In the past year alone, Netflix has extended its partnership agreement with Deutsche Telekom, struck an expanded international deal with Orange, and made a multi-year agreement with Altice covering France, Portugal, Israel and the Dominican Republic. A pact with OSN in February 2018 marked Netflix's first partnership in the Middle East and North Africa region.

"In the post-OTT era we now see the blending of the key SVOD apps by pay TV cable operators," says Anthony Smith-Chaigneau, senior director of product marketing at Nagra – the digital TV division of the Kudelski Group. "Some would say this is letting the fox into the hen-house but we see that, with the cable operators delivering good broadband, content bundling (premium to skinny), 4K services and access to SVOD and other apps, this is a strategic move to retain customers."

Ed Border, principal analyst at Ampere Analysis, says that operator decisions to embrace Netflix are dependent on the state of the market, the operator's market share, as well as the relationship between the platform and the operator.

"Effectively, two things need to happen in order for an operator to onboard an SVOD platform: the operator needs to be profiting

enough from its other complementary existing services – such as broadband, mobile, VOD, transactional – so that it does not see the SVOD platform as a direct competitor, more as a complementary add-on-package; and the SVOD platform needs to be a part of a shared ecosystem in a country, rather than a service which is actively driving consumers away from pay TV in that market," says Border.

"The benefits therefore are providing a more well-rounded and attractive package for consumers, without investing in a proprietary SVOD platform. However, if an SVOD platform is onboarded prematurely, or the operator isn't able to adjust to changing market conditions, the operator could be left in a position where they are integrating a direct competitor."

While Netflix's pay TV footprint is now wide, the same cannot be said for its main global SVOD rival, Amazon Prime Video. Speaking at Cable Congress last year, Amazon Video managing director, Alex Green, said that Amazon was "definitely open" to video partnerships with cable operators. Green, who previously worked for companies including BT TV and Virgin Media, denied that Amazon posed a direct threat to the traditional TV operator model and said that services like Amazon, Netflix and others "easily co-exist" with the cable and pay TV industry.

"In markets in which Amazon just has a Prime Video play, without the wider Prime customers or Amazon Channels packages, it is certainly possible that we'll start to see a greater number of onboarding deals on set top boxes," said Border. However, he claims this is unlikely in the large markets of the US, UK and Germany where Amazon's Channels initiative essentially establishes the company as a rival content aggregator – one that possesses "the financial might to potentially bid for high-value sports or content deals".

The road to Gigabit broadband

Delivering the highest top-line data speeds has long been one of the key tools in cable operators' armoury in competing with rival fixed-line players. Over the last couple of years, this has crystallised in the race to deliver Gigabit speeds over cable – seen as a suitable benchmark that the industry can use to showcase its ability to deliver ultra high-speed broadband to a wide base.

Cornel Ciocirlan, chief technology officer, EMEA at cable technology provider Arris, says that upgrading or re-architecting networks to make them capable of delivering ultra fast speeds has been a high priority of operators for the last year or two.

Operators are not only investing in upgrading access networks but also looking at future-proofing in-home WiFI networks to ensure that consumers are able to take advantage of the headline speeds on offer, he says.

"A lot of operators are taking the approach, in preparing for the future, that once you put a cable modem with embedded WiFi in the home, it will be there for years. You need to prepare your subscribers for these high-speed services," says Ciocirlan.

On the network side, says Ciocirlan, operators are investing in CCAP systems and a distributed architecture alongside DOCSIS 3.1.

"The fusion of these technologies gives you the potential to do Full Duplex DOCSIS, providing 1Gpbs or 1.2Gbps or whatever speed you offer upstream as well as downstream," he says. "It is not necessary this year but in 2019-20 it will be another tool in the toolbox for operators to deploy."

Full Duplex DOCSIS, which Com Hem recently announced it was piloting, enables cable to compete head-on with fibre providers by offering symmetrical high-speed broadband. There is relatively little evidence of market demand for symmetrical capacity currently. In fact, Ciocirlan says that demand for downstream capacity is still growing faster than demand for upstream capacity thanks to the relative decline of peer-to-peer traffic and growing demand for streaming video and music.

How much demand there actually is for Gigabit speeds in general remains unclear – both ultra high-speeds and symmetrical capacity are currently seen more as effective marketing tools than as something people need in practice.

Nevertheless, Liberty Global last year commissioned a survey by Arthur D. Little that predicted what it called the 'GigaWorld innovation cycle' would unlock a market worth between €250 billion and €660 billion a year in Europe by 2025, and between €1.3 trillion and €3.5 trillion globally by that date.

According to Arthur D. Little, this will be driven by three major families of 'GigaApps': augmented discovery, blending digital content with the physical world; virtual telepresence, enabling virtual social interaction; and automated living, the delegation of human decisions and tasks to technology and appliances.

For now, however, Gigabit speeds are primarily useful as a marketing tool for service providers in their battle with one another for new customers, and major cable operators such as Liberty and Vodafone are busy upgrading their networks to deliver Gigabit broadband.

Vodafone Germany last year unveiled a four-year plan to invest €2 billion upgrading its networks.

At last year's Cable Congress, Colin Buechner, Liberty's managing director of access networks, said that the deployment of DOCSIS 3.1 technology by the operator would enable it not only to offer 1Gbps services but also to improve the reliability of its network and use spectrum more efficiently.

Buechner confirmed that downstream capacity remained the key competitive battleground – a market fact that, ahead of the deployment of Full Duplex DOCSIS, still gives cable an advantage in competition with fibre operators.

alphonso
The TV Data Company

Q&A: Ashish Chordia, co-founder and CEO, Alphonso

Alphonso CEO Ashish Chordia talks about TV data and its likely impact on the video industry.

What are the key applications of TV data and which groups in the TV value chain stand to benefit most?

TV viewership data has always been in scarce supply, gathered typically on a small panel basis for many decades. Census-scale deterministic viewership data from smart TVs, connected set-top-boxes and other living room devices is now a sought-after currency for brands and networks who want to engage verified TV audiences across all screens.

Viewership data can be used not only to better connect with an audience, but also to measure the effectiveness of TV ad campaigns and hybrid TV and digital ad campaigns, in driving actual results. Smart brands are using TV data to understand their TV campaign ROI in great detail; for example, which creatives are driving the most tune-in to a programme, or, which shows and day-parts are most effective at driving foot traffic into stores and dealerships. TV viewership data, at large scale, is also instrumental in media planning and buying both for traditional linear TV, new OTT services and related digital media.

What kinds of data are advertisers looking for and what needs to be put in place to enable both them and TV distributors to benefit?

Advertisers are looking beyond basic demographics to decide where to target their ads and how to optimise campaign spend. Knowing which households have been exposed to an ad for a particular product enables them to optimise ad frequency on a one-to-one basis. And because TV data can also tell them the optimal frequency for driving foot traffic and sales, they can be a lot smarter about their spend.

One of the most common use cases we see in the US is conquering a competitor's audience. Advertisers can utilise viewership data not just for their own brand, but for their key competitors or their entire category. So they can compete for mindshare in a much more effective way by reaching granular audience segments (for example, people who have seen my competitor's ad) across all the devices they use, in a more personal, interactive way.

What other uses of data are being prioritised by device manufacturers and TV service providers and how do they stand to benefit?

TV broadcasters and networks benefit from having access to real-time audience insights, which allows them to understand audience trends on how shows are being consumed. They can better understand audience loyalty for certain shows, which in turn helps them promote the shows better to increase monetisation of ad-supported content.

On the device side, smart TV makers can now have a much deeper understanding of how their customers interact with their product. Real-time audience dashboards can give TV OEMs a direct view into product usage that they have never had before. And this data becomes the foundation for value-added services that create more stickiness for their customers, like personalised discovery and recommendations that take advantage of large-scale viewership data. To put this into context, if a household never misses an Arsenal match, the TV should know to automatically recommend a breaking sports news clip about a trade of an Arsenal player or a game highlight they may have missed.

And with the amount of viewership data that is available, the days of the static electronic programming guide are numbered. Why should my on-screen guide be the same as yours, if we generally watch very different types of programmes? With content fragmented across live linear TV and OTT, TV data becomes a means of universal search and discovery. It's time to think about not just presenting what's on for all viewers, but presenting a curated list of upcoming programmes - whether on linear TV, apps or OTT services, that is tailored to each individual viewer or household. Large-scale TV data will get us there in the next few years.

What challenges stand in the way of the industry as a whole making the most of TV data? And what solutions are available?

The challenges are in three main categories: adoption, consumer experience, and overall maturity of the digital TV ecosystem. First, the industry's tools, methodology, processes and norms need to evolve out of the currently trusted panel-based models, toward using true census scale data. That change is happening at fast pace, but still has a long way to go. Alphonso for one offers free TV ad campaign insights on thousands of US brands and brand categories, and this free access will be coming this year to the UK. Second, the consumer experience has to be bullet-proof. Privacy is a key concern from the consumer perspective and the industry needs to self-regulate and build better practices wherever consumer data is concerned. A high level of trust between the industry and consumers is paramount. We have endeavoured to build consumer choice and privacy into the core of our products, and that remains a top priority as we enter new markets. Finally, the overall TV and big data ecosystems must come together to develop means of data exchange that can lead to high-value services such as advanced audience measurement across all forms of TV, and attribution reporting for TV ads. This is something we're happy to be working on with MTM, Sky, Adobe, EGTA and others, as part of a consortium to help drive understanding and awareness of cross-platform, cross-border measurement.

Other industries with complimentary data sets have made much more progress than the TV industry in understanding the value of combined data sources. Expect TV data to help brands have a much better understanding of how TV drives auto sales, CPG sales, foot traffic, website visits and app downloads. We're driving massive innovation in multi-touch attribution and cross-media effectiveness.

Mobile and convergence

For cable operators, scale no longer means achieving a wider reach for their fixed networks but being in a position to compete effectively in mobile as well. Fixed-mobile combinations such as the VodafoneZiggo joint venture in the Netherlands, Tele2's acquisition of Com Hem, Telenet's purchase of BASE and T-Mobile's acquisition of UPC Austria account for a growing number of M&A deals involving cable operators.

"Broadband is a core service for cable providers. Our research shows that it is an anchor service in the eyes of consumer. However, providers must offer other services given moves by all players to move towards multiplay convergent bundles. This includes mobile, pay TV, OTT video, and other services including the connected home, home automation and connected car. The future is all about a bigger bundle of things," says Paolo Pescatore, vice-president, multiplay and media at CCS Insight.

Cable's own embrace of mobile as the fourth leg in the quad-play is in some respects an awkward fit. Mobile subscriptions are seen as an individual rather than a household purchase. Pay-as-you-go is unpredictable, while cable's strength is reliable and predicable cash-flow. Mobile also requires additional investment in network infrastructure – either by developing a full MNO or one of the types of of MVNO that offer varying levels of control.

"This is a tough decision and heavily depends on the market dynamics. Owning a mobile operator is extremely costly, need to acquire spectrum, rolling out a network. And do this across territories requires a huge investment. However, it does make sense to own the entire end-to-end fixed and mobile networks especially with the arrival of 5G. For cable providers who own the pipes in the ground, becoming an MVNO is the most sensible option," says Pescatore.

Mobile is also highly price-competitive, and multi-play – where TV, fixed and mobile broadband and telephony are bundled together – is even more price competitive – not to mention potentially destructive if operators behave 'irrationally' in search of market share.

Liberty Global president and CEO Mike Fries, speaking at the UBS Annual Global Media and Communications conference last year, highlighted the fact that adding a mobile play introduces an additional element of volatility into cable operators' revenues, which has an onward impact on operating cash-flow. Nevertheless, said Fries, Liberty is offering quad-play "in every market that we can" as convergence becomes the key battleground for service providers.

Mobile has simply become a must-have for cable operators in order to compete effectively with multi-play rivals. The battle between telecom service providers in all Europe's major markets is a multi-play battle. Convergence is the key growth opportunity for operators in markets where new subscribers are increasingly hard to come by.

Convergence is the rationale behind the merger in Sweden of mobile Tele2 and Com Hem has to create the second largest mobile telephony and fixed broadband provider in Sweden behind Telia.

"In essence it is all about offering your customers more choice. If they already sign up to cable, why not offer other services? In most cases it will cheaper than what a rival mobile operator offers. And the cable provider will be able to generate more additional revenue from customers. Recent earnings from numerous European telcos clearly underline the value of multiplay convergent bundles in driving lower churn, which is another benefit," says Pescatore.

Operators are also engaged in 'convergence' in other ways by offering multiscreen availability of their content line-ups and interactive features.

Mobile screens are now highly relevant devices in terms of the consumption of professional content. According to Ooyala's Global Video Index, over 60% of video plays will be on mobile devices by the middle of this year. Ooyala found that long-form video viewing on mobile devices grew by 77% in the third quarter of 2017 alone. Ericsson's Mobility Report, meanwhile, predicts that video will account for 75% of all mobile data traffic by 2023.

Service providers can – and do – build a mobile video play by zero-rating bandwidth hungry video services, encouraging the use of mobile devices to consume long-form video.

The smart home

The rise of the Internet of Things (IoT) market has made the smart home an increasingly interesting area for service providers to both generate additional revenue streams and keep customers loyal. According to research by Strategy Analytics,

nearly 20 billion IoT and connected devices were deployed worldwide by the end of 2017, with a further 10 billion to be added over the next four years.

Among the operators getting involved in this space is Swedish cable provider Com Hem. It teamed up with home security and smart energy technology provider TMPL last year to offer services to its customers such as energy monitoring. In the Netherlands, KPN's venture investment arm invested in Nello, a developer of a smart intercom solution, which enables keyless, remote access to residential buildings by upgrading existing intercom systems. KPN Ventures said that this was part of its wider strategy to invest in connected home services.

KPN itself rolled out smart home services back in 2016 after partnering with one of Europe's leaders in this space, Deutsche Telekom. KPN SmartLife lets users control home security and energy consumption and the platform's underlying technology is based on Deutsche Telekom's QIVICON connected home platform.

Deutsche Telekom launched QIVICON back in 2013. The platform is designed to integrate with multiple connected devices and support new revenue generating services around areas like home security, energy consumption and smart lights. Partners using the platform include Philips, Osram, Miele, Samsung, Huawei and Sonos, and Deutsche Telekom customers can control services using its Magenta SmartHome App.

Filipe Oliveira, market analyst at Futuresource Consulting, says that while the potential for added revenues will appeal to operators, on the whole this is not the main reason for them moving into the smart home space.

"What we see happening is operators offering smart home as a way to tie their customers into the service," says Oliveira, adding that a revamped set-top box is one option for cable TV providers hoping to introduce a new hub or controller for the smart home.

"If you're thinking of cutting the cord or getting rid of your pay TV because you have Netflix or you get your entertainment from other providers, it's easy to stop paying. But if it comes out with additional services – if all of a sudden your lighting stops working or your security cameras stopped working, or your climate control stopped working and you need to set all that up either with a new provider or even with a different pay TV provider – then you think twice."

Other players in this space include Orange, which introduced Smart Home By Orange in Poland in 2013 and in France in 2014, while a number of operators – including EE TV in the UK – have launched voice control support by linking up with Amazon Echo and Echo Dot devices. Elsewhere, Sky launched an all-in-one sound system last year with Devialet, marking the first partner-product designed and built under a licence by the French audio start-up.

In the US, Comcast announced at this year's Consumer Electronics Show plans to significantly expand its home automation capabilities. The cable giant said its goal is to make Xfinity the "home operating system that integrates the best IoT devices" – including existing Xfinity Home security and automation products.

The regulatory environment

European telecommunications regulations have been encouraging investment in network infrastructure and delivering high-speed broadband, and cable operators have broadly been supportive of EU rulemaking while occasionally decrying what they see as politically motivated meddling by national watchdogs. The EC has worked towards the adoption of a new Electronic Communications Code to further the goal of creating very high-capacity networks to enable the Digital Single Market to become a reality. The EC estimated that €500 billion of investment up to 2025 would be necessary to meet its goals, with current investment plans estimated to fall short of this by about €155 billion.

The goal of the code is to amend existing directives covering the framework for communications, access, authorisation and universal service, and to integrate all four into a single text. In terms of access, the code introduces a regulatory objective of promoting access to, and take-up of, high-speed fixed and mobile broadband.

To encourage investment, it sought to limit the imposition of market access obligations by national regulators to markets that don't function properly. Cable industry body Cable Europe welcomed the proposals, but expressed strong reservations about the application of competition rules in cases of 'joint dominance' – where two operators are dominant in a particular market.

Last year Belgian cable operator Telenet, which operates in Flanders, filed an objection to local regulator BIPT's attempt to force it and Wallonian operator Voo to open up their networks to third parties on the basis that each was dominant in the local cable market. Telenet argued that BIPT's attempt to create a distinction between cable and the wider telecom market was artificial and undermined the fundamental principle that only operators with 'significant market power' should be regulated.

Liberty Global has also faced regulatory problems in the Netherlands – most recently because of a European General Court ruling that annulled its joint venture with Vodafone on technical grounds, requiring the EC to re-examine its original approval of the deal because it failed to conduct a proper analysis of the impact of the deal on the premium sports market. Liberty Global CEO Mike Fries was able to dismiss that ruling as "more of a nuisance" than a major blow and said he was "pretty confident the deal would ultimately be cleared". ●

A sharper picture

Opinions differ about how quickly consumers are warming to UHD TV, but many hurdles still stand in the way of the format becoming mainstream. Adrian Pennington provides an update.

Since the DVB specification for ultra high definition (UHD) TV, UHD-1 Phase 2, was approved at the end of 2016, global rollout has been slow but unspectacular. *Digital TV Europe's* assessment, based on a range of expert contributions, is that as gaps across the supply chain are plugged, 2018 should herald a significant uplift in UHD services.

Peter Siebert, DVB executive director, admits the format has had a slower start by comparison to the move from SD to HD. "Many UHD channel launches are playing out loops of pre-recorded material; not what I regard as UHD programming," he says. "But this is an evolution, not a big bang, and follows the normal investment and upgrade cycle for consumers and broadcasters."

Thomas Wrede, vice-president, new technology and standards, media Platforms at satellite operator SES offers a more upbeat

Insighjt TV has been natively shooting and producing 50fps video since 2014.

perspective. "We see a real acceleration of Ultra HD – by 2025, analysts expect over 700 UHD channels globally. In fact, UHD is growing so fast that it is outpacing HD development, if you compare their respective rollout globally: UHD started with 13 channels on its first year of commercialisation and grew to 92 two years later [by year-end 2017], while HD went from 13 channels to 32 in the same time-frame."

Rian Bester, CEO at Insight TV, the UHD factual-entertainment channel says: "There's a definite acceleration in rollout and adoption to which Phase 2 has contributed. The enhancements brought by HDR [High Dynamic Range], WGC [Wide Color Gamut] and HFR [High Frame Rate] are blatantly obvious and undeniable. But would I call it a 'tipping point'? Not totally."

David Mercer, director at Strategy Analytics believes that the UHD rollout is "a little behind schedule compared to what many were hoping a year or so ago" but concurs that momentum is building again. "We would be surprised if most major platforms were not carrying at least some UHD services by the end of this year."

A recent IABM survey indicated that 35% of broadcasters would launch a UHD service in the next three years; 59% said they would roll out within a decade.

In addition, the ATSC 3.0 standard will advance UHD deployments outside of DVB territories beginning in Korea and then the US. ATSC 3.0 is designed to deliver 4K UHD and immersive audio with the increased payload capacity combined with HEVC encoding.

Widening content gap

The take-up of UHD TVs is obviously a critical indicator for broadcasters. Strategy Analytics estimates that 176 million UHD TVs were in use worldwide by the end of 2017. Household penetration had reached 19% in North America and 14% in Western Europe.

"These data-points are helping to persuade many broadcasters that they have to start considering their own plans for UHD very seriously," says Mercer.

By comparison, Futuresource Consulting reported worldwide penetration of 8% at end of 2017, which by 2021 is expected to increase to 71% of sales and 29% penetration. Shipments of UHD streaming devices – Roku, Apple etc. – are rising too. At the end of 2017 they comprised about eight million or 36% of all units sold. "We have moved beyond the phase of early adoption of UHD and are now in the strong growth phase," says Futuresource's Tristan Veale.

If UHD has had a sluggish start, most pundits pin the blame on costs incurred in higher bandwidth and increases in capital expenditure.

"Broadcasters need to be convinced of the business case for the extra cost in studio infrastructure when many PSBs are financially still digesting HD," says Siebert. "I'm convinced UHD will come but it will follow normal investment cycles, except where there's an opportunity to move to build greenfield [operations]."

The media industry is always in a state of transition: analogue to digital, SD to HD, and now SDI to IP-based production infrastructure, as well shifting from HD to UHD formats.

"These transitions are time-consuming and expensive, which leads to a classic chicken and egg situation," says Insight's Bester. "We have stores full of UHD TVs and consumers that want to purchase them but not enough content to warrant the expense."

Futuresource attributes the widening gap between sales of 4K-ready consumer hardware and content to the expense of contribution and distribution: "Most operators see little incentive to shorten replacement lifecycles in order to provide 4K UHD STBs to consumers," says Veale. As it stands, marketing from hardware manufacturers "is the most important factor in upgrading customers to 4K capable devices", says Veale, rather than a desire for UHD content.

There is little holding back 4K UHD production, with Bester claiming its cost has been "overstated" since 2014. "If you simply applied the same inefficient HD workflow to UHD, the cost difference can be significant, but through efficient and smart workflow adaptions, the cost increment can be minimised," he says. "Camera development, storage pricing and more competition in the post production space has squeezed the incremental variance even further."

Futuresource points to a significant quantity of content that is being recorded and produced in UHD, but not immediately being made available to consumers. Rather, content production is being 'future-proofed' for later UHD launches.

"The gap between hardware and content availability exists because providers need to be convinced of the commercial benefits of making their content available in the higher-definition format," says Globecast's UK managing director Samuel Lemercier. "This is

not happening overnight."

There's little in the way of premium value in 4K to be squeezed from the consumer. Competition among SVOD streamers has actually lowered the price of 4K UHD content. Apple meanwhile doesn't differentiate in price between its 4K and HD titles on iTunes, forcing Amazon and Google to remove or reduce the differential for their resolution-specific tiers.

Yet content is deemed "critically important" by Tim Felstead, director of strategic and operational marketing at technology provider Rohde & Schwarz, and "a necessity" by Leonid Berkovich, vice-president of marketing at Viaccess-Orca. "With 4K content available, the entire business can be rolled out," says Berkovich.

The pressure to create more content is however dampened by the available outlet channels, a factor that Felstead links to the reluctance of media companies to allocate the bandwidth required for UHD.

"Broadcasters must invest in UHD at multiple points, with this investment currently not being matched by the financial return from customers," Felstead says. "As such, the upgrades and content acquisition are challenging for many operators that are seeing increasingly suppressed margins."

Even the Winter Olympics featured limited 4K production by comparison with the 4,000 hours – including 860 live hours – it produced in HD. Matters may change this summer when FIFA and production partner Sony produce all matches from the World Cup in Russia in 4K HDR, although how many free-to-air public and commercial rights holders like the BBC and ITV will launch a UHD service, even temporarily, for viewers is unclear.

Alphabet soup

Of course, in addition to bandwidth-hungry 4K resolution, the UHD-1 Phase 2 spec caters for the introduction of additional audio-visual features, the most significant being HDR, which delivers a bigger visual punch than added pixel count.

Telestream's vice-president of product management, media workflow and production solutions, Scott Murray's take is typical: "4K is not necessarily a driver, especially when the images are so compressed. What will drive widespread adoption is not more pixels but HDR."

The industry typically uses the term 'HDR' to refer to the combination of three image technologies and not the HDR transfer function alone: HDR plus Wide Colour Gamut (WCG) plus 10-bit sample bit depth.

HDR techniques can be applied with "visually stunning results", says Felstead, to all resolutions and frame rates.

However, there has been no clear agreement on the 'best' HDR solution to use. As was apparent at CES, TV manufacturers have clearly anticipated that a winner from the format war will not emerge anytime soon, and are insuring themselves by offering all manner of formats in their latest display lines.

The good news is that there's near universal agreement that the HDR10 and HLG formats are must-haves, with Dolby Vision a strong third place. Samsung is a notable abstainer with regards to Dolby Vision. Philips/Technicolor's HDR technology also has supporters – LG for one. The DVB for its part has ratified HLG and PQ10 (from which HDR10 is derived) in UHD Phase 2.

To clarify further, Dolby also had a hand in developing PQ (Perceptual Quantization) and derived its 12-bit solution from it. Veale says: "This can be delivered in such a way that if a device has a 10-bit display then it will seamlessly show at the fullest capabilities of the display. However, if the panel is 12-bit and the company licenses the Dolby Vision product then it will show Dolby Vision in all its glory."

Devised by NHK and the BBC, allowing backward compatibility with SDR displays, it's no surprise that HLG is emerging as the front-runner in Europe and Japan for traditional live/linear services. Recent announcements from AT&T/DirecTV add weight to Strategy Analytics' prediction that HLG will become the de facto distribution standard in broadcast.

"The absence of metadata simplifies the entire broadcast chain especially for live events and scene-referred technology will not need re-mastering for different display types," says Felstead of HLG.

However, it is the dynamic metadata of Dolby Vision and the metadata extension to HDR10 (HDR10+) that makes these formats more suitable for on-demand content and services. Originally developed by Samsung as an alternative to paying Dolby a licence, royalty-free HDR10+ has the backing of Fox and Warner Bros (along with Panasonic).

Most, if not all, online services use different HDR technologies simultaneously. For example, Netflix has content available in HDR10 and Dolby Vision. Amazon, Wuaki.tv, iTunes, YouTube, Sony's Ultra Streaming Service, Sony Playstation, Google Play Movies & TV, Vudu, UltraFlix, Fandango, Xbox one and Playstation 4 are all offering a few – but not necessarily all – of the various technologies.

"Once the specifications settle down we will see a standard set available across the whole spectrum of UHD 4K video viewing services online," predicts Nagra's product marketing chief Anthony Smith-Chaigneau. "Standards have reached a milestone where quality is at a level required with new standards taking backward compatibility as a main requirement. For example, HDR10+ is now used by Amazon services and is backwards compatible with HDR10 devices."

Indeed, Amazon's entire library of HDR content on Amazon Prime, including *The Grand Tour,* is now available in the HDR10+ standard, and can be viewed on 2017 UHD Samsung televisions.

Further standards convergence is likely. Over time, Futuresource predicts HLG will likely be phased out in favour of PQ10. "The developers of HLG themselves admitted that it is a stopgap to streamline the switch over to HDR," says Veale. "Many TVs and AV hardware use a transfer function to convert a HLG stream to PQ10 anyway as displays more commonly support this correctly."

HD HDR services are likely to appear too, says Veale, "particularly for broadcasters with bandwidth constraints, such as terrestrial broadcasters or those distributing via IPTV that

"Once the specifications settle down we will see a standard set available across the whole spectrum of UHD 4K video viewing services online."

Anthony Smith-Chaigneau

are able to apply some ABR [adaptive bitrates]."

In spite of the success of early non-HDR UHD services – notably those of Sky and BT in the UK – it's clear that the debate around HDR has contributed to the uncertainty many broadcasters feel about deploying UHD services.

EBU senior executive Dr Hans Hoffman has criticised industry players for "being short-sighted in the belief that pushing individual HDR solutions will drive market adoption more quickly and to their own benefit". He believes that investments and new service rollouts will remain on hold until the industry stabilises.

Smith-Chaigneau meanwhile reports that some operators launching UHD services are opting to go without HDR "because the quality was still not entirely satisfactory". "They still want to fine tune the end-to-end chain to make sure they deliver a clear difference compared to the HD equivalent," he says.

Mercer confirms this. "Many broadcasters are reluctant to commit to UHD until there's greater clarity on which HDR standards will be adopted, and until uncertainty over technical issues in workflow and distribution has been eliminated," he says. However, he adds, "Sooner or later broadcasters will come under pressure from competitors, not just in TV but in OTT and even 4K Blu-ray, to make their move towards 4K and HDR."

Currently, the technology is ready for end-to-end UHD HDR. There are production, encoding and networking delivery technologies for broadcast and unicast, as well as decoder equipment and TVs able to process 4Kp60 in HDR10 and HLG10 with some channel-based Next-Gen Audio.

The 'full fat UHD experience' of NGA, HFR and WCG is likely to play a secondary role in the perception of most consumers at this stage, but equipment manufacturers are nevertheless positioning themselves to differentiate their hardware.

WCG (BT.2020) "is the natural next step of competition between TV hardware manufacturers once they have exhausted their attempts to promote HDR," suggests Veale. "Implementation in conjunction with HDR is already in train but broadcasters are largely dependent on content producers and the consumer's AV set-up for the quality of WCG their customers receive."

With regard to Higher Frame Rate, "the issue becomes one of economy with

The distribution bottleneck

If content is King then distribution is Kong, as a well-known cable executive once said. UHD bandwidth requirements are intensive, even using HEVC compression. Satellite, therefore, will continue to play well in the UHD world, given its point-to-multipoint advantage, for a good decade because, with satellite, additional subscribers don't add bandwidth costs. This benefit grows as viewers consume more and more UHD content.

Statistics provided by satellite research group NSR reveal that just 0.17% of channels distributed using satellite are UHD today, a figure that includes DTH platforms and video distribution to cable TV and IPTV headends. However, notes senior analyst Alan Crisp, this figure under-represents the benefit to satellite operators, given the significantly greater bandwidth requirements for UHD.

NSR predicts that 930 UHD channels will be on air by 2026, a figure in line with Euroconsult's forecast of 1,116 UHD channels by 2025 out of a global total of about 47,300 channels. "UHD is being increasingly viewed as a defensive play for many DTH platforms rather than from a purely additional revenue perspective," says Crisp. "Introducing UHD is one way of being able to increase subscriber levels and retain existing customers to combat competition from OTT and other services."

SES carries 38 UHD channels (including demo and test channels) out of a total of over 7,700 TV channels. By comparison, Eutelsat carries a total 6,755 channels of which 1,200 are HD and 15 are UHD as of December 2017.

"Despite some negative market sentiment about satellite distribution, it's still a very efficient way of reaching a large audience," argues Samuel Lemercier, UK managing director of Globecast, which doesn't manage or distribute any permanent UHD channels at present but says it regularly fulfils UHD event requests for broadcast and OTT carriage. "But as always, it comes down to cost. For a cable operator to manage UHD signals, they have to roll out new set-top boxes, which is expensive. For broadcasters to deliver UHD, using a CDN model is a better approach. CDNs can handle large amounts of content effortlessly via the very high bandwidth."

Nivedita Nouvel, vice-president of marketing at CDN technology specialist Broadpeak, feels the industry's biggest challenge is finding a cost-effective approach that supports a variety of networks; satellite, cable, and ADSL.

"For live content, satellite can carry UHD video in real time by using more spectrum per channel," she says. "This scenario is more difficult for VOD, which requires unicast streaming. Push VOD allows operators to store popular content in the house, and this approach might be key to reducing bandwidth costs."

Fixed-line distributors' fortunes will vary depending on the infrastructure choices they have made. Cable operators want to leverage new technologies such as DOCSIS 3.1 to distribute UHD over IP. For telcos, investing in fibre is necessary. "Once CCAP is deployed, the cost per bit will be more affordable [for cable]," says Thierry Fautier, Harmonic's vice-president of video strategy. "For IPTV [operators], a

Fautier: Once CCAP is deployed, the cost per bit will be more affordable.

25Mbps stream is only possible over fibre, and that infrastructure is gradually being built. We will have to wait few more years until UHD becomes mainstream with fibre. In the meantime, 1080p is the highest resolution that can be delivered over DSL."

For OTT TV providers, given that the average internet speed today is 8Mbps, most content reaching homes is likely to be 1080p60/50 rather than true UHD. However, there are developments in train to help.

"The cost of CDNs is, of course, having a direct impact on UHD deployments, but in the case of Netflix, we see that OTT operators can successfully build their own CDN delivery mechanism to cope with the bandwidth and cost challenges of UHD," says Fautier. "Content-aware encoding [CAE] techniques are being used by Netflix and we expect similar techniques for upcoming live UHD deployments. CAE will bring UHD bitrates down to 15Mbps for 20160p60 or from 5Mbps to 3Mbps for 1080p60 [recommendations provided by the Ultra HD Forum]."

Amazon's *The Grand Tour* is now available in the HDR10+ standard.

media[companies needing to estimate if HFR will bring them ROI", says Felstead. "Temporal resolution is a fine goal for certain types of media like sport, but it is only one element and not currently a high priority in the minds of our customers."

Next generation audio (NGA) meanwhile seems to be getting the least priority and attention, but Bester believes this will rapidly change during 2018. NGA implementation has already begun; BT Sport and Sky have adopted Dolby Atmos. "The audio experience is incredibly important," agrees Peter Sellar, associate director, broadcast, at the UK's Digital Television Group. "NGA provides other advantages through the ability to personalise the experience, or tailor for accessibility."

Insight TV is evaluating NGA and says the possibilities of applying it to content are promising for various reasons, "ranging from providing specific audio for the hearing impaired to adding additional audio per scene. The engagement for our viewers can be greatly increased," says Bester.

The key issue here is that broadcasters are totally reliant on the consumer's audio set-up. As a way round this, Futuresource notes that some broadcasters are offering relatively low-priced set-top boxes integrated into a soundbar.

HFR would seem to be an easier transition, since there are only two main choices: 100Hz or 120Hz. In reality, says Hoffman of the EBU, a number of questions are still unresolved: "Will consumer electronics devices apply simple or more sophisticated frame rate conversion algorithms, or will they depend on a true higher frame rate broadcast signal? And what about interfaces such as HDMI to carry HFR signals?"

While cinema appears stuck on 24 frames per second for theatrical exhibition, rates of 50/60fps are realistic for TV today. TV drama and theatrical will likely remain at 24/25fps for editorial reasons but higher frame rates can enhance the quality sports, which could ultimately benefit from the maximum of 120fps.

Insight has been natively shooting and producing 50fps video since 2014 but Bester says the upper limits of the UHD spec are not yet practical. "100/120fps are just found in test content as camera, post-production and broadcast chains and even displays are still catching up," he says.

Unlike HDR and WCG the (double or triple) increase in bits required for HFR needs to be taken into account. HFR-suitable mezzanine compression systems are an option, but they will require standardisation and add complexity in the production chain.

Smith-Chaigneau says, "Devices have to handle very large amounts of data in their circuitry and this raises many challenges. Additionally, in distribution, backwards compatibility issues with legacy standard frame rate [SFR] systems need to be solved."

These cost factors "means the market isn't going to see any dramatic uptake of HFR in the foreseeable future," says Lemercier.

Consumer confusion

The downside of all these twists and turns in the development of UHD will be the inevitable confusion and incompatibility issues experienced by consumers. Even Samsung's marketing team appeared confused when in a tweet from IFA2017 they claimed HDR10+ as superior to HDR+, Samsung's own proprietary SDR-to-HDR upconversion algorithm.

Futuresource reports that consumer awareness of HDR has "barely grown" over the last two years and remains at 40% in the US and closer to 20% in Europe and developed APAC countries. Veale says: "From an idealistic view it shouldn't be marketed as HDR. It should be an intrinsic part of the UHD development as was originally intended, and therefore not a monetisable element. The improvement of UHD resolution over HD isn't that significant but when HDR, WGC and NGA are included as standard, then it becomes a much more attractive proposition and one which will be a significant improvement of quality when consumers do upgrade."

Telestream's Murray calls the whole alphabet soup a "muddle", while VO's Berkovich says that "operators have ideas about how to monetise HDR, but it's hard to project how much viewers are willing to pay for this service."

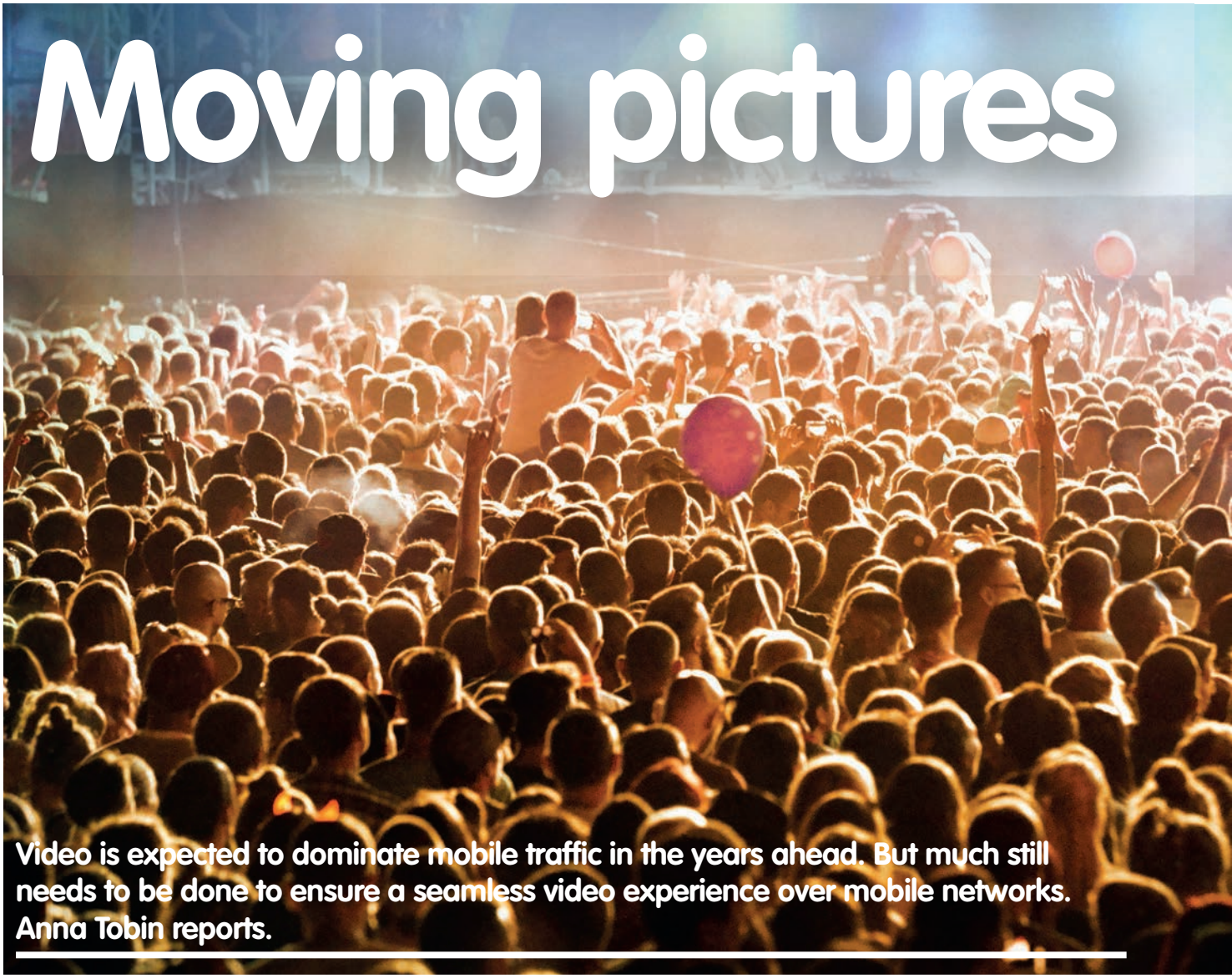
The availability of suitable broadband connections could also have an impact on consumer perceptions. Some 34 million households worldwide have a 4K TV and access to an SVOD package with UHD content. "Most of these would have watched UHD content at some point this way. However, due to broadband limitations, most wouldn't consistently stream in UHD," says Veale.

"Early adopters will be frustrated by the older inadequacies of their equipment or may not realise it's not performing as desired," says Smith-Chaigneau. "Many consumers will have to make their own assumption, and clearly learn that higher quality means higher bandwidth requirements. It is a safe assumption that UHD still requires at least 16Mbps of bandwidth to be considered good enough quality."

The quest for the perfect picture is by no means over. It will no doubt carry on for many years to come, driven by the desire to bring true-to-life images into the home.

Will content providers and distributors go further? The prospect of 8K broadcasts is currently disregarded by nearly every contributor to this piece. Bester's view is typical: "With 4K UHD content still relatively scarce and only really starting to drive mass market awareness and adoption now, I simply cannot see 8K on the near horizon. I simply don't see it as feasible nor desirable in this decade." ●

Moving pictures



Video is expected to dominate mobile traffic in the years ahead. But much still needs to be done to ensure a seamless video experience over mobile networks. Anna Tobin reports.

The demand for video on mobile screens is at an all time high and it is yet to peak. According to a Nokia Bell Labs mobility traffic report, mobile video streaming will represent 79% of all mobile data traffic by 2020.

Although users have often come to expect slow start times due to buffering and disruptions in service, the smartphone is already often the first screen of choice for consuming video for the younger generation. And for people in much of the developing world, it's the only available screen.

This presents two challenges for content creators and distributors: they must iron out those quality problems and they must ensure that their content can be viewed anywhere, at anytime, efficiently and economically. Consumers will increasingly demand reductions in data consumption charges or expect near universal broadband/WiFi access. If operators are to thrive under these conditions they will need to adapt their business models too.

LTE technology

What was a very narrow geographical target area for distributing mobile content is now getting much wider as a result of developments in LTE broadcast or eMBMS technology. This has been a game changer for the industry, according to Roland Mestric, director of marketing for Nokia's IP video business: "LTE broadcast deployments have focused on delivering media content to contained locations, such as stadiums and concert halls, often limited to the duration of an event. Nokia, however, has shown that eMBMS can be used to cover a much larger area," he says. "Single Frequency Networks [SFN] technology has been tested over a large footprint to prepare for wide area TV coverage up to nationwide networks. With SFN, all base stations use exactly the same frequency to transmit TV content, which maximises the number of simultaneous TV channels broadcast over a large geographical area in a given amount of spectrum. The technology holds promising new business opportunities for mobile operators to distribute TV over their LTE mobile broadband infrastructure. Subscribers will be able to watch TV on their devices

Nokia: New video standards and processing techniques will bring even more scale.

without eating into their mobile data plan and independent of network load."

As LTE broadcast becomes scalable, with an LTE/eMBMS-enabled device it will be possible to receive content delivered over a multicast stream. The problem is that not all devices support eMBMS. Samsung is on board, but Apple has yet to implement the technology, which cuts out a substantial chunk of the market.

It does have a growing fan base though, says Michael Archer, chief strategist, mobile technologies at CDN giant Akamai: "An ecosystem of support has gradually built up around the technology, including major network operators and network vendors, to the point where the technology now has the base to attract investment and take off. The investment case has also been improved by the emergence of additional use cases on top of video streaming, such as delivery of OTA software updates," he says.

With growing demand for highly personalised content, particularly when it comes to revenue boosting fully-targeted adverts, some mobile operators are concentrating on enhancing the unicast experience, optimising the bandwidth in their core network and monetising adaptive bitrate (ABR) and HTTP-based video streams.

But for linear TV, ABR has a fundamental scaling disadvantage, with a requirement for an exponential growth in the amount of bandwidth required when compared to broadcast LTE, says Mestric at Nokia. However, he adds that there are a number of tools in the operator's arsenal that can go a long way to alleviating some of these issues: "Dynamic rate shaping and bitrate throttling allow an operator to deliver ABR manifests where the bitrate and resolution are more suited to network saturation and device characteristics," he explains. "Re-fragmentation can adapt ABR fragments to make them more suitable for the loss and latencies expected on mobile networks and conditional encoding provides the ability to re-encode content at lower rates that vary as a function of video complexity and network saturation."

Currently, the most efficient way of delivering mobile video depends very much on what your use case and business model is, says Archer at Akamai: "If you're a subscription viewing company with a library of box-sets to stream to viewers, for example, in today's market unicast is almost always going to be the obvious solution. If you're looking at live video – such as sporting events – LTE broadcast is currently going to be best for that content," he says. "If a company is quadplay and owns the content and the infrastructure, the economic model changes and, again, LTE broadcast is probably the better option for live delivery."

Universal WiFi

Interestingly, while mobile video technology has been developing, user behaviour has been changing too and this is not necessarily in a way that exactly matches the evolution of technological possibilities. This has led to an interesting paradox, says Simon Trudelle, senior director of product marketing at Nagra.

"While video consumption on mobile devices outside the home is on the rise, a lot of that consumption comes from short-form video or it is done offline, as various physical constraints – from steel beams in buildings to subway tunnels or fast-moving cars and trains – make stable and reliable 4G video network access challenging at best, or simply not possible in many mobility situations," says Trudelle. "In parallel, subscribers also want personalised replay video access even when at stadiums, transportation hubs and open-air live events, where the concentration of 10, 20 or 50,000-plus devices connecting to an on-demand service puts severe stress on mobile infrastructure or pushes up costs too high. Industrial WiFi solutions have been emerging as an alternative solution for these specific use cases."

Even though LTE broadcast technology makes large-scale consumption possible, most long-form mobile video is currently watched via WiFi networks or it's downloaded to be watched later on the go.

"Mobile networks are already seeing a good deal of video streaming usage, enabled by the higher data rates of 4G networks," says Archer at Akamai. "It's less common for pre-recorded content such as TV programmes and films to be streamed over mobile networks. One of the key reasons for this is that data consumption, if you don't have an all-you-can-eat bundle, is far more expensive over a mobile network than over a fixed-line or WiFi."

With strong competition in the market leading to mobile data prices falling and the creation of unlimited packages, cellular streaming could see an upsurge in popularity in the near future, but until that coverage is more or less universal it will remain lacking in reliability. And unless the distribution costs fall this business model won't be sustainable for operators in the long term either.

The realisation that the appetite for long-form content on the move isn't there –because the quality isn't up to scratch and because consuming video in this way gobbles up expensive data – has also led service and content providers to look at pushing new content formats. They are trying to move into short-form content provision, says Trudelle at Nagra: "It's clear that innovative service providers are now looking at ways to provide short-form content better suited to the mobile

on-the-go experience and fight for 'mobile eye share', keeping subscribers on their service throughout the day, instead of seeing them consume video on platforms like YouTube and Facebook," he says. "Powering these new video services requires more flexible back-end platforms that can address multiple consumer profiles, over multiple delivery networks. Such use cases were taken into account in the design of our OpenTV Signature Edition platform announced at IBC 2017."

The 5G future

As 5G becomes a mainstream mobile technology it holds out the possibility of revolutionising mobile and, through 5G fixed wireless access (FWA), home-based media consumption too. 5G could provide faster and higher bit-rate streaming and enhanced quality, delivering data rates of tens of megabytes to tens of thousands of viewers with microsecond latency. "It will enable seamless delivery of highly personalised unicast content delivery, while paving the way for Ultra HD and 360°/VR viewing on mobile devices and video enabled CE devices that leverage FWA in the home," predicts Mestric at Nokia.

5G will open up innovative revenue streams too, says Christopher Mueller, CTO and co-founder of Bitmovin: "The traditional telcos are having to adapt their business models. They have to invest in the infrastructure and in mobile broadband technology in general to keep up with the pace of change," he says.

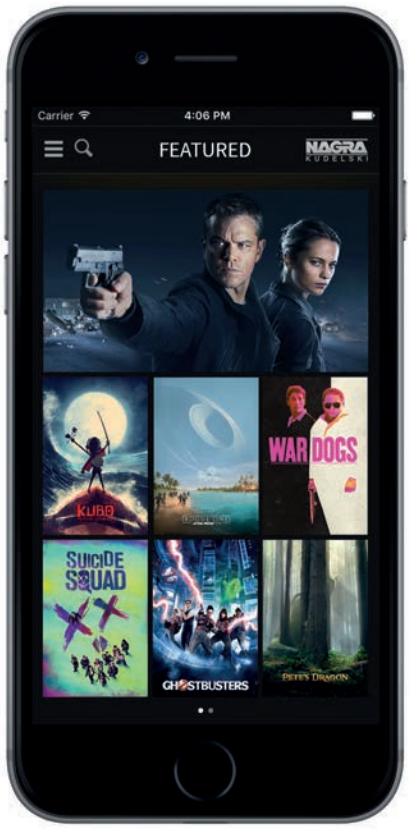
There is, however, the possibility of a geographical rift opening up, driven by quality of service and 5G reach in urban and rural areas, suggests Trudelle at Nagra: "Mobile operators are entering a new phase of the market where the battle is for geographical 4G/5G coverage and overall quality of service for video streaming. Insufficient reach and/or video quality will lead to subscriber churn and more so in remote areas," he says. "For subscribers living in urban areas, where Wi-Fi is the pre-dominant way of accessing video services, mobile bandwidth and QoS are less of an issue. So differentiation going forward may actually be on price and service bundling. Some traditional pay TV providers may find an opportunity to become MVNOs or partner with telcos to create content and network bundles and strengthen their subscriber relationships, while adding a revenue-generating unit to their business model...The impact of 5G networks on the content industry will be positive overall, yet it has to be seen as an incremental opportunity to increase reach, more than a revolution that would send other network technologies to the recycling bin."

Video is already the largest consumer of data on the average smartphone. This would seem to make it a priority for standardisation, but progress has been slow in this area. Things are beginning to change, however, says Archer at Akamai.

"One area where broadcasters are getting involved in the conversation is through 5G-Xcast – a project bringing broadcasters together to analyse the requirements for future technologies, ranging from UHDTV to mixed reality and to scope the technical specifications needed to deliver them," he explains. "In developing media delivery solutions, the project aims to take account of the wider use ranges of 5G, including services to vehicles, public safety and health and the Internet of Things to ensure that they dovetail together. However, examples of this collaboration are too few and far between and there is currently no agreed standard for 5G deployments. The biggest issue will be getting mobile operators and broadcasters to agree to build one ecosystem that works everywhere and for everyone. There are not enough broadcasters getting involved in setting the standards and more of them should be talking to their MNO partners to establish better ways to work together."

"If you're a subscription viewing company with a library of box-sets to stream to viewers, in today's market unicast is almost always going to be the obvious solution."

Michael Archer, Akamai



Nagra: service providers are aiming to provide short content better suited to mobile.

In order for 5G to take the baton from 4G, a near universal standard or group of standards needs to be agreed.

New video standards are needed to make 5G video consumption grow and they will happen, says Mestric at Nokia: "New video standards and processing techniques will bring even more scale. Fast Start and Low Lag based on 'chunk encoding' and CMAF provide ultra-low latency, ensuring that the mobile stream is in sync with the broadcast feed, so each viewer enjoys a goal at the same time, regardless of the content source," he says. "In anticipation of 5G video streaming, organisations including the Stream Video Alliance and 5G Americas are already defining recommendations and best practice-related mobile delivery and addressing subjects as diverse as scalability, quality of experience, geo-fencing for licensed content and service protection for streaming media."

As history has shown for every mobile technology that has come before it, 5G standards will eventually emerge, but the technology may be stalled in the meantime. While the waiting game is played out, consumers will continue to use a mix of delivery systems involving live play and download to enhance their experience of watching video on the move. ●

ZATTOO
TV SOLUTIONS

Q&A: Gernot Jaeger, Zattoo

Gernot Jaeger, chief officer, B2B TV solutions at Zattoo, talks about the cloud-based multiscreen IPTV service newly launched by 1&1, a tier-one European telco and one of Germany's largest internet service providers.

What is the solution and platform behind the 1&1 cloud-based IPTV Service?

For 1&1 we developed 1&1 Digital-TV, which is a fully hosted and managed white label IPTV solution. The multiscreen IPTV service for 1&1 is based on unicast IPTV, via direct network peerings with 1&1. 1&1 provides the network, ensuring the quality of the solution thanks to a strong broadband network and a strong Quality of Service approach. Zattoo then provides the entire technical platform that makes a state-of-the-art TV and entertainment experience happen.

Our platform covers everything from ingest of TV signals and encoding and transcoding, including digital rights management, all the way through to the middleware and the front-end applications. This includes applications for an operator set-top box as well as for Apple TV and Amazon Fire TV, iOS and Android mobile devices. For all this, we leverage our own, proprietary end-to-end platform that has been built over 12 years, nowadays serving more than three million customers.

All in all, it is a true one-stop solution that enables 1&1 to market its TV offerings comprising various product bundles, thus raising ARPU, retaining existing customers and attracting new ones.

Is this a live-only IPTV service or does it come with non-linear content as well?

For 1&1, we bring together linear and non-linear content to any device and thereby respond to the increasing demand from end-customers for innovative features such as cloud PVR, catch-up and time shift TV. The catch-up feature for example, enables viewers to watch selected programmes up to seven days following the initial broadcast.

Due to specific German content regulations, the cloud-based PVR even provides each 1&1 customer with an individual copy of each recording for his exclusive use. This is different from the 'master copy' network PVR that we provide in many other projects.

What are the drivers pushing the development of IPTV services?

We observe that customer expectation are higher than ever and growing fast, thus shaping the requirements for a state-of-the-art IPTV service. Very clearly, more devices are becoming relevant. Certainly, the big screen and the set-top box remain core but, next to them, a growing number of devices play a role. For example, we see a strong trend towards consumer streaming devices such as Apple TV and Amazon Fire TV.

At the same time, more use cases have to be supported smoothly, ranging from multi-device scenarios at home to true OTT/TV Everywhere scenarios for both linear and non-linear content.

And of course, every TV service provider has to gear up for more and more types of content, as additional content requires seamless integration and content discovery as well as smart monetisation across all devices.

What are the benefits for 1&1 from using the Zattoo multiscreen IPTV service?

A proven track record, short time to market, operator grade availability and cost efficiency are very clear benefits for every operator working with Zattoo. On top of this, we guarantee ongoing further developments of the entire IPTV solution – we call this the Zattoo 'Evergreening Roadmap'.

Let's take a look at time to market: for 1&1 there was no complex project of setting up systems or integrating various vendor solutions into one end-to-end solution. This end-to-end approach, combined with our vast experience in setting up IPTV as well as OTT services makes it easy to implement and deliver excellent products with a very short time to market.

Let's also look at cost efficiency: there is no huge investment in hardware, software or in a team, simply because all of this is part of the service provided by Zattoo. And at the same time 1&1 benefits directly from the economies of scale that come with a big platform serving dozens of tenants and millions of end customers.

In a nutshell: we are very happy to provide 1&1 with a cloud-based multiscreen IPTV service that comes with a standard setting feature set. And we see ourselves as a long-term innovation partner because it takes both the best network and the best TV service to constantly stay ahead of the curve.

Technology in focus

Infrastructure, equipment and product news for digital media distribution

In Brief

Net+ taps VO

Swiss service provider Net+ has tapped Viaccess-Orca (VO) to power its new multiscreen TV service. The Net+ Mobile TV offering is powered by VO Player and offers a unified viewer experience across Android and iOS devices, as well as via web browsers on PCs and Macs. VO Player is compliant with the DVB-Sub subtitle format and also includes digital rights management for video-on-demand and live content.

Telekom Romania partners with Zenterio

Telekom Romania is using Zenterio OS to power a new series of set-top boxes for its TV Interactiv IPTV service. Telekom Romania customers can now enjoy features like live TV, video-on-demand, network PVR, time-shifted TV, USB PVR on the new STBs. Zenterio OS is an independent operating system for interactive TV that is designed to give operators the flexibility to choose set-top boxes from any vendor.

Canal Digital renews Xstream

Nordic streaming and TV everywhere provider, Canal Digital, has renewed its partnership with over-the-top (OTT) cloud technology provider Xstream. The deal will allow Canal Digital to further grow its own and parent company Telenor's customer base across the Nordic markets.

Roku reports strong 2017 results but shares drop

Roku recorded a strong year of growth in 2017, but its share price dropped in after-hours trading following a weaker than expected revenue outlook for the current quarter.

Announcing its full year and fourth quarter 2017 results, Roku said that Q4 net revenue grew 28% year-on-year to US$188.3 million (€153 million), driven by platform growth of 129% YoY to US$85.4 million. Gross profit for Q4 grew 64% year-on-year to US$73.5 million.

The company said that it enters 2018 with strong momentum and is "very encouraged" by the trends it is seeing in its platform segment. However, its Q1 net revenue outlook of US$120 million to US$130 million missed analyst projections of US$132 million, according to Bloomberg stats.

Roku described 2017 as a "milestone year" with revenue growing 29% year-on-year to US$513 million. This compares to revenue growth of 25% in 2016.

A key driver for growth was the company's platform segment. Here revenues were up 115% year-over-year to a record $225 million, driven by strength across Roku's advertising and content distribution services.

Full-year gross profit grew 65% to US$200 million, streaming hours were up 59% year-on-year to 14.8 billion hours, while active Roku accounts stood at 19.3 million at the end of Q4, up 44% compared to a year earlier.

Trailing 12-month ARPU in the fourth quarter was a record US$13.78, up 48% year-over-year.

"The tectonic shifts we are seeing in the media and entertainment industries continue to strengthen our streaming opportunity, creating new paths for Roku to pursue and deliver rapid revenue and gross profit growth," said Roku CEO Anthony Wood, and CFO Steve Louden, in a statement.

"The fourth quarter of 2017 was a fantastic quarter for Roku, reinforcing our leading position in smart TVs, streaming players, OTT advertising and content distribution. We have never been more excited about the future of our business."

Rai Way bids for Telecom Italia DTT towers

Italian digital-terrestrial TV platform operator Rai Way has teamed up with financial investor F2i Fondi Italiani per le Infrastructture (F2i) to launch a joint bid for Telecom Italia-owned Persidera.

The deal would see F2i hold and manage the rights of use of the spectrum currently granted to Persidera for its DTT multiplexes, while Rai Way would acquire the network infrastructure with the simultaneous signing of a long-term agreement for the supply of broadcasting services.

Persidera owns and operates five DTT multisplexes. Telecom Italia is selling the unit off as part of a move to obtain European competition authorities' approval for Vivendi's acquisition of control of the company.

Rai Way has not disclosed financial terms of the bid. Analysts at Berenberg, citing Italian reports that it was under €250 million, noted that this figure is well below the amount Telecom Italia has reportedly been seeking for the unit. Berenberg said that a €250 million deal, valuing Persidera at about six times EBITDA, "would appear at face value to be a very cheap deal" for an infrastructure company with a 50% EBITDA margin.

Berenberg's analysts said that "the transaction would appear to fit with Rai Way's objectives of increasing the number of multiplexes it manages" and would make strategic sense.

The structure of the agreement, giving F2i control of the spectrum, is designed to work around Italian regulations that prevent one company from controlling more than five digital-terrestrial multiplexes. Rai Way currently controls five for pubcaster Rai while Persidera owns a further five muxes.

Androme.tv launches platform

Technology outfit Androme has launched what it describes as an all-in-one TV platform. According to the company, Androme.tv is already being deployed by Portuguese cable operator Nowo and Maltese cable operator Melita for their recently-launched advanced TV offerings, according to the company.

Androme, which has developed services for Telenet and Liberty Global previously, is pitching Androme.tv as a multi-device end-to-end TV platform that enables services including live TV, video-on-demand, catch up TV, startover TV and local and network-based DVR across multiple devices.

"Maintaining consistency in high user satisfaction is a challenge currently facing the market. In the coming years, this will remain important as telecom companies come under pressure to serve the right content to their end users via, for example, recommendations," said Raf Van Ham, founder of Androme.tv.

"With androme.tv, we offer the TV functionality that is desperately needed in the telecommunications and broadcast industry: the agile and cost efficient deployment of TV platforms. We focus on working this way so we can better adapt to new trends in the competitive and fast-moving TV ecosystem."

Portugal's Nowo launched its new TV service early last year, with Androme supplying the user interface. Other technology partners include infrastructure provider VP Media Solutions, compression specialist AWS Elememtal, security provider castLabs and CDN specialist Broadpeak. Melita also launched its new TV service last year, tapping set-top supplier ADB for an RDK-based platform.

Nagra divests SmarDTV

Kudelski Group, owner of Nagra, saw its profits take a hit from the slowdown of traditional TV activities, with operating income before restructuring costs dropping from US$113.5 million (€92.3 million) to US$48.1 million. Net income, which was also hit by restructuring costs, plunged from US$88.5 million to US$2.7 million. Kudelski overall saw its revenues from continuing operations rise by 7.1% to US$1.068 billion, driven by increased cybersecurity and public access sales.

Digital TV segment revenues grew by 4.2% to reach US$688.4 million, after a year in which Kudelski sought to streamline its digital TV operations to "seize new opportunities more effectively," focusing on end-to-end offerings and integrating its Conax unit.

Kudelski's results didn't include its SmarDTV conditional access module and set-top unit, which is being treated as a discontinued operation.

Caavo launches unified TV box

US set-top box start-up Caavo has launched the first 5,000 units of its unified home entertainment box.

The device was built with a vision of "simplifying TV". It connecting different TV inputs and services – including live TV, DVR and streaming apps – and offers universal search across them.

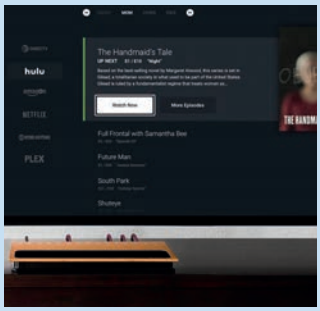
The box has a voice-enabled remote, is compatible with Amazon Echo or Dot devices, works with 4K TVs but is not HDR compatible, and is available for US$399 (€324).

"With Caavo, everyone has access to all the amazing content they already pay for, regardless of where it lives. Ultimately, this creates more choice and the freedom to watch TV the way you want," said the company in a statement.

Last year Caavo closed a US$17.5 million round of Series B funding from backers including Time Warner Investments and Lauder Partners.

Caavo's other backers include Sky, which invested US$2 million in 2016 when the company was still a stealth startup.

Caavo was co-founded in 2015 by late Slingbox founder Blake Krikorian and tech veterans Andrew Einaudi, Ashish Aggarwal and Vinod Gopinath. Einaudi is company CEO and previously



worked at Microsoft on the Xbox team that launched the Xbox One.

Krikorian died unexpectedly in 2016 aged 48. He first developed the Slingbox TV streaming media device with his brother Jason Krikorian in 2002 and sold the business to Echostar in 2007.

In Brief

JW Player taps SpotX

Video player provider JW Player has teamed up with programmatic ad technology outfit SpotX to launch Video Player Bidding, a new product that is designed to simplify 'header bidding' whereby publishers can simultaneously garner bids for ad impressions from multiple demand sources at once, before calling the ad server. According to SpotX, Video Player Bidding streamlines the header bidding process by combining JW Player's global publisher footprint with SpotX's advertising technology solutions.

France Télévisions taps Arkena

France Télévisions has chosen Arkena to provide transcoding capability for its planned – and much delayed – SVOD offering. Arkena's content management system, Cloud4Media, will receive media files, and check, prepare and deliver them in all formats necessary for distribution across multiple devices. "We are honoured to have been chosen to work on a project of this magnitude," said Jean-Baptiste Darras, chief marketing officer of Arkena.

RDK Management and Broadcom partner

RDK Management and semiconductor firm Broadcom have partnered to integrate chipset-level software development kits (SDKs) from Broadcom with RDK's open source software. The move is designed to make a common software porting layer to simplify and standardise RDK deployments across set-boxes used by video and broadband service providers around the world.

In Brief

ABOX42 teams up with Singularity

Germany-based set-top provider ABOX42 has teamed up with US-based TV technology outfit Singularity to market a joint TV everywhere solution for the US, Canadian and South and Central American markets. ABOX42 has integrated its Smart STB platform with Singularity's HTML5-based middleware to support IPTV and OTT multiscreen services with features such as live, catch-up, restart, and on-demand TV.

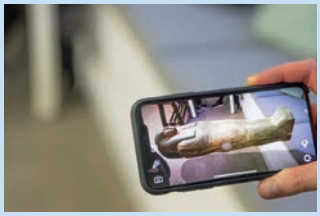
Axel Springer invests in Magic Leap

Axel Springer Digital Ventures has invested in US-based Magic Leap, a company that is focused on integrating digital content into real world environments. Axel Springer said that the investment marks part of its efforts to participate in innovative technologies that have the potential to "present journalistic content and classifieds in new formats and environments". The German-based digital publisher, famed for titles like *Die Welt*, *Bild* and *Business Insider*, also has shares in companies like Jaunt, AirBnB and Uber.

Liberty taps Benu Networks for IPv6 migration

Liberty Global is tapping virtual network specialist Benu Networks to provide technology to enable it to transition its broadband user base to IPv6. The international cable operator is using Benu Networks' IPv6 Dual-Stack DS-Lite solution, based on its Virtual Service Edge platform to move to IPv6 without having a negative impact on existing subscribers' use of IPv4 internet or applications.

BBC launches first AR app for *Civilisations*



The BBC is to launch its first augmented reality app to accompany its new arts and culture series, *Civilisations*. The UK public broadcaster has teamed up with over 30 museums from across the country to create content for the app.

'Civilisations AR' is being developed by BBC Research & Development and Nexus Studios, enabling people to explore some of the most important exhibits from UK museums in the comfort of their living rooms. The app will be available for IOS and Android from the launch of the new series.

A range of artefacts have been digitally scanned and will be available to view as part of a new virtual exhibition. The app will feature exhibits including an ancient Egyptian mummy from Torquay Museum, Rodin's The Kiss from the National Museum of Wales and The Umbrian Madonna and Child from the National Museum of Scotland.

The app will feature a 'magic spotlight' feature that will enable users to uncover annotations, audio and imagery that enrich the story of each exhibit. Other features include: X-ray, enabling users to see through or inside an object; Restoration, allowing users to virtually restore artefacts; and Navigation, enabling them to browse an exhibition geographically using an AR globe or via the themes of the series.

BBC R&D has separately developed a Story Explorer tool to let people discover the series and its themes in a digital way through a range of text, clips and images, and is making a range of digital tools available to partner organisations of the Civilsations Festival, a programme of events to accompany the series.

Museums, galleries and libraries will be able to use a Single Operator Mixing Application tool, built by BBC R&D, enabling them to produce live broadcasts of talks, panel discussions and Q&As to a professional broadcast quality. Another tool, Seenit, will enable museums to engage audiences by enabling them to contribute their own user-generated films.

Live sports VR platform LiveLike raises US$9.6m

LiveLike, a technology company focused around offering live sports in virtual reality, has raised US$9.6 million (€7.8 million) in Series B funding.

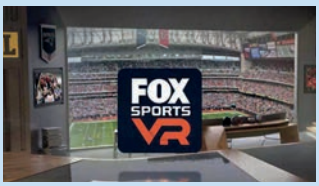
LiveLike's live streaming platform is designed to transport users into an interactive 360° 'virtual suite' overlooking the field of a featured sport event, where users can connect with friends or other fans to watch the game via Facebook. The company's mission is to make live sports viewing more dynamic and immersive by using virtual, augmented and mixed reality to more broadly appeal to tech-obsessed sports fans.

LikeLike has partnerships with the likes of FOX Sports and the French Tennis Federation and said it will use the investment to expand its partnerships and further build out its product and platform to make it "even simpler and frictionless for users".

The company's backers include former NBA commissioner David Stern, Evolution Media, Courtside Ventures, Elysian Park, Dentsu Ventures, and the GC VR Gaming Tracker Fund. New investors in this round were Greycroft Partners and Lepe Partners.

"LiveLike has been successful because we have built a platform that connects with younger generations seeking a more non-traditional experience," said Andre Lorenceau, founder and chief executive officer of LiveLike. "Thanks to our investors, we are now in a position to hire for key positions and continue delivering a premier next-generation sports OTT platform."

Stern said: "We have all seen that the media landscape is changing. With the rise of cord cutting and the increased competition from e-sports, there has come a true need to evolve and



innovate live sports viewing. What has me excited about LiveLike is how they are bringing social viewing to live sports in a way that connects friends and fans like never before."

Fox Sports senior vice-president of field and technical operations, Michael Davies, said: "In our nearly two years of working with LiveLike, creating our FOX Sports VR app and working on sports like hockey, football, basketball and soccer, we have found them to be innovative, nimble, and attentive to this exciting and rapidly changing platform. We are looking forward to continuing to imagine the future with them."

On the move

Robert Redeleanu is to take over from **Frans-Willem de Kloet** as CEO of Liberty Global-owned UPC Poland. Redeleanu, who is currently CEO of UPC Hungary and Romania, will replace De Kloet, who is leaving the company, on April 1. Redeleanu has served as CEO of UPC Romania since 2013, taking additional responsibility for the Hungarian operation in 2016. Before joining Liberty Global he was marketing director of telecom company Telemobil.

Dailymotion has appointed former Red Bull TV executive **David Rios**, to head up Latin American and US Hispanic content partnerships. Most recently he was head of programme and platform promotion at Red Bull TV and before that he was Red Bull TV's head of global communications.

Satellite operator AsiaSat has promoted **Lara Kwok** to vice-president of business development and strategy. Kwok, who joined the company in August as director of business development and strategy, takes up her new role following the retirement of **Sabrina Cubbon**. Kwok previously worked as principal of the Greater China investment team at The Longreach Group and has also held a number of positions with investment banks in New York and Hong Kong.

AMC Networks International, the operator and distributor of pay TV channels in Spain and Portugal, has expanded its business unit to now include France and Italy. The newly titled AMC Networks International Southern Europe will be headquartered in Madrid and manage Sundance TV France and will explore new business opportunities in the French market and work toward distributing channels and content in Italy. **Eduardo Zulueta** will lead the new unit, under the title of president of AMC Networks International Southern Europe. Zulueta is also president of AMC Networks International Latin America. **Manuel Balsera**, senior vice president of AMC Networks International Southern Europe, will lead affiliates, ad sales, marketing and digital. **Pilar de las Casas** will oversee the programming and acquisitions strategy as vice president of cinema and documentary channels.

Former Dyson CEO **Max Conze** will take up the same role at German broadcast group ProSiebenSat.1 Media. He will take up his post on June 1 and replace **Thomas Ebeling**. ProSiebenSat.1 deputy CEO **Conrad Albert** will act as interim chairman before Conze joins. Ebeling's departure was announced in November last year. He was originally due to step down in mid-2019.

NBC Entertainment president **Jennifer Salke** is to become Amazon Studio's head of content, replacing **Roy Price** who departed in October. Price departed the company amid sexual harassment claims late last year, which preceded the departures of Amazon Studios department heads such as **Joe Lewis** and **Conrad Riggs**. In the interim, Amazon Studios COO **Albert Cheng** took on Price's duties. Cheng, Amazon worldwide film head **Jason Ropell** and worldwide TV acquisitions chief VP **Brad Beale** will all report to Salke.

Satellite operator SES has named the CEO of SES Networks, **Steve Collar**, as the next president and CEO of the wider company. At the same time **Andrew Browne**, who was until recently chief financial officer of O3b Networks and CFO of SES between 2010 and 2013, has been appointed as the next CFO of SES. Both Collar and Browne start work as CEO and CFO designate with immediate effect, but they will officially take up their roles on April 5 following the company's AGM. Current president and CEO, **Karim Michel Sabbagh**, will step down to "spend time with his family and to pursue new interests" and current CFO **Padraig McCarthy** will retire.

Vodafone UK has named Vodafone Group's technology enterprise director, **Scott Petty**, to chief technology officer. Petty succeeds **Jorge Fernandes**, who was recently named CTO of Rogers Communications in Canada. At the same time Vodafone UK's head of mobile networks, **Kye Prigg**, will take on responsibility for fixed networks. Petty joined Vodafone from Dimension Data in 2009 and since then has held various roles at the company.

Andy Kaplan is one of three president-level executives leaving Sony Pictures Entertainment (SPE), with worldwide distribution chief **Keith Le Goy** rising in the reshuffle. Kaplan will leave his post as president of worldwide TV channels with Sony Pictures Television chairman **Mike Hopkins** taking on these networks plus Crackle, Sony's streaming service. Also exiting is president and TV marketing chief **Sheraton Kalouria** and home entertainment boss **Man Jit Singh**, whose exit means Le Goy will take on that area of the business as well as leading worldwide sales operations. Le Goy reports into Hopkins, who joined from US VOD service Hulu towards the end of last year, and Sony Motion Picture Group chairman **Tom Rothman**. The changes come after former Fox Networks Group chief **Tony Vinciquerra** became CEO and chairman of SPE in June last year.

Fox Networks Group (FNG) has promoted from within for a new head of its digital consumer group. **Jeff Hughes**, who joined FNG in 2016, will succeed **Brian Sullivan**. He is a former BSkyB (now Sky UK) and Omniphone exec. Sullivan, a former Sky Deutschland and Sky UK chief, was promoted to president and COO of FNG last year. Hughes was previously FNG's president of technology. His new role puts him in charge of digital strategy, TV everywhere initiatives and streaming products.

Please email contributions to: stuart.thomson@knect365.com

"In a world where Google, Amazon and Facebook are increasingly focused on video, it is no wonder that scale appeals. The big legacy media players are facing ambitious and deep-pocketed tech companies that are coming to eat – or at the least eat into – their lunch."

Size matters

Recent months have seen a plethora of mega-media deals on boardroom tables. No doubt more will be coming, but not all will work out. All this buying and selling looks on the face of it to be about one thing: that bigger is better. But is the calculus as simple as size wins?

Look at the recently tanked deal of Danish telco TDC buying the entertainment assets of Sweden's Modern Times Group (MTG). Lauded as creating the "first truly convergent media and communications provider in Europe", the deal was unceremoniously dumped only a few days after it was announced. The reason? TDC received a sweetened takeover offer from a consortium led by infrastructure group Macquarie and the latter was wholly uninterested in the MTG assets, which by their very nature are riskier than the cash flow to be reaped from relatively predictable telecoms infrastructure.

Has TDC missed an opportunity? Perhaps. There's no doubt that MTG – or parts of it – will still be very much in play, given that major shareholder Kinnevik is facing a TV concentration issue following the merger of Tele2 and Com Hem. Perhaps MTGx, the group's high-growth business, including online businesses and eSports, could be spun off.

The failure of the TDC-MTG deal doesn't cloud the overriding view in media that scale matters and that ownership of content assets is a key differentiator.

Look at the continued moves by Liberty Global to work with Vodafone in markets around Europe. Liberty is looking to sell "overlapping assets" in markets where the two players both operate, namely Germany, where Vodafone already owns Kabel Deutschland. Scale matters.

And look at Telefónica, which has seen its video ARPU grow 8% in 2017 off the back of its investment in content – including original commissions like *La Peste*, which helped drive viewing to its on-demand platform. Content and especially content that appeals to local tastes, is going to be increasingly important to drive attention and audiences to any service, be it a triple-play communications provider or a local broadcaster.

Indeed, in a world where Google, Amazon and Facebook are increasingly focused on video, it is no wonder that scale appeals. The big legacy media players are facing ambitious and deep-pocketed tech companies that are coming to eat – or at the least eat into – their lunch.

Christmas 2017 produced the shocking news that media's consummate mogul Rupert Murdoch was throwing in the towel and selling the bulk of the 21st Century Fox entertainment business to Disney. He may be in his 80s but Murdoch is still very much with it. His view is that the big tech giants are best fought by joining forces with a bigger player.

"From a strategic point of view, this is the right time to sell," Murdoch told reporters and analysts when the deal was announced. "We are living in an age of disruption."

The US$66billion (€54 billion) deal will see the Fox movie studio, television productions, and international businesses, including Star TV in Asia and Sky in Europe, go to Disney. Disney's ambitions in over the top services – and its majority ownership of BamTech which gives it control over its OTT technology – combined with Fox's content, its stake in Sky Europe and ownership of Star TV should help propel the new Disney-Fox combo to build out alternatives to Netflix and Amazon services much faster. OTT is key to future growth as the appetite for SVOD services continues to grow.

The demand for premium episodic drama series has gone through the roof, driven by the growing appetite of the big tech platforms for stand-out series that will raise their visibility among potential subscribers and as Facebook and YouTube up their video ambitions, among advertisers as well.

Meanwhile, HBO is thinking more internationally about both HBO Go, it's OTT offer, and about its content, while Netflix and Amazon are also ramping up commissioning that appeals to local tastes. The likes of HBO, and producers and distributors from FremantleMedia to the BBC are all having to move more quickly – and greenlight projects faster – as the competition for A-list talent grows.

Not to say that there aren't partnerships to be struck between the tech giants and the legacy media companies with both broadcasters and platforms co-commissioning with Netflix and Amazon. It's not a zero sum game. At least not at the moment. But Disney, which has pledged to no longer sell its content to Netflix, is clear that building its own scale business is key to thriving going forward.

Meanwhile HBO parent company Time Warner is also part of the scale-play land-grab, having agreed last year to be bought by telecom giant AT&T. The combination of big telco AT&T and big media company Time Warner has an increasingly familiar ring. The scale-play, including vertical integration of distribution and content assets, is now considered the *sine qua non* of survival in the "disrupted' media landscape. ●

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