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INNOVATION DRIVES GROWTH

IN 2017, PREMIUM VIDEO SOLIDIFIED ITS REPUTATION WITH MARKETERS AS A BRAND-SAFE PLATFORM THAT CAN DELIVER ENGAGED AUDIENCES AT SCALE. Ad views saw strong double-digit growth across both the U.S. and Europe, even in the face of a rapidly changing and competitive marketplace. Publishers, operators, and the supporting ecosystem enabled more content, across more devices, to a wider audience. They also offered advertisers innovative new solutions. In a live viewing first, Super Bowl LI allowed spot scheduling in conjunction with custom ad insertions for 135 participating affiliates. Across all digital platforms the national linear ad stream could be mirrored, and affiliate markets received local ad insertions, demonstrating how the linear and digital worlds can be bridged.

Over the course of 2017, data from the Video Monetization Report (VMR) highlighted four major trends:

- 1. **THE BIG SCREEN SITS AT THE HEART OF THE VIEWING EXPERIENCE** When combined, over-the-top (OTT) and set-top box video on-demand (STB VOD) grew to represent 50% of all ad view share in the U.S. and 37% in Europe, up from less than 10% in both markets just three years ago. In the U.S., OTT now commands the largest ad view share of any device-type at 31%, revealing the power of 'the big screen' to connect with audiences at scale.
- 2. THE MARKET MOVES TOWARDS 'PREMIUM SYNDICATION' The share of syndicated ad views doubled this year and now represent 27% of the U.S. premium video market. Multichannel Video Programming Distributor (MVPD) syndication doubled as viewers took advantage of growing TV Everywhere offerings and virtual MVPD 'skinny bundles.' Concurrently ad view growth on aggregator platforms was flat, as publishers sought to limit use of 'non-premium' channels.
- 3. PROGRAMMATIC GROWTH REMAINS CONSTRAINED Automated transactions were responsible for 10% and 21% of ad views in the U.S. and Europe respectively, the same proportions as 2016. While significant, growth was moderated by nascent measurement capabilities across platforms such as OTT, a desire for even greater user experience control, and uncertainty around the role programmatic will play as part of an overall monetization strategy.
- 4. AD REPETITION RATES FALL The number of full-episode videos with repeat ads declined from 23% to 14% in the U.S. As demand for premium video inventory increases, both in terms of the number and diversity of advertisers, publishers are better able to manage the ad experience given the increased creative mix. This flexibility will become increasingly important in the face of competition from ad-free subscription models.

THE RISE OF INTELLIGENT TV

In 2018, the premium video value proposition will continue to evolve. Publishers will present a far more data-centric vision to advertisers, and the wider ecosystem will seek to enable this. Expect momentum in the following areas:

- 1. TV GETS MORE INTELLIGENT Publishers continue to push to unify their linear and digital inventory to deliver single campaigns, across multiple screens, to their target audience. Looking forward, publishers will combine TV's ability to efficiently distribute engaging stories to quality audiences at scale with new data, targeting, and attribution capabilities. Bringing together the best attributes of traditional TV with digital capabilities will enable improved campaign performance for agencies and brand marketers, while increasing the value of inventory for the publisher.
- 2. LIVE VIEWING GROWTH AND INNOVATION Live video now represents 31% of all ad views in the U.S., up from 5% five years ago. In 2018, the Winter Olympics, FIFA World Cup and other major sporting events will drive huge audiences, along with a network effect where live stream, simulcast, catch-up and clip inventory all expand. A seamless viewer experience across live events also leads to escalating technical complexity, creating real-time challenges for publishers and their technology vendors, which must be met to achieve revenue potential.
- 3. SCALING PROGRAMMATIC MODELS Programmatic transaction models make it easier for advertisers to source inventory at scale and enable publishers to manage inventory efficiently. Technology vendors will need to invest in infrastructure and service delivery to make programmatic transactions more effective on devices beyond desktop and mobile and seamlessly support ad decisioning for live events.

This edition of the VMR examines trends in the industry and our underlying data for the full year 2017, while exploring some of the ways the industry continues to advance and evolve in the way it delivers value for advertisers, viewers, and publishers.

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2017 TIMELINE

A LOOK BACK AT THE EVENTS THAT MOVED THE INDUSTRY FORWARD

2017 ———

THE YEAR IN VIDEO

This timeline looks back at some of the major events of 2017 that have and will continue to influence the evolution of the premium video industry.

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VIDEO MONETIZATION



SUPER BOWL LI

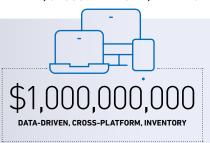
With a total audience of 172 million, Super Bowl LI was the year's most watched program in the U.S. In a Super Bowl streaming first, FOX supported

CUSTOM DIGITAL AD INSERTIONS FOR 135
PARTICIPATING AFFILIATES, ACROSS ALL
DIGITAL PLATFORMS, using FreeWheel's Hybrid
Linear Digital Ad Scheduler (HyLDA)².

TELEVISION UPFRONTS

Network executives extol the virtues of premium television over the offerings of tech rivals. Joe Marchese, Fox's President of Ad Revenue, noted that in terms of ad impressions, "on any given Tuesday, Fox primetime delivers 700 Facebooks™. Publishers also showcased their own data-driven capabilities. NBCU's Linda Yaccarino committed to provide advertisers \$1BN OF

Yaccarino committed to provide advertisers \$1BN OF DATA-DRIVEN, CROSS-PLATFORM, INVENTORY⁵.



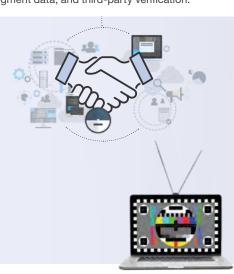
IAB ANNUAL LEADERSHIP MEETING

Brands, led by Marc Pritchard, Chief Brand Officer at Procter & Gamble, announced a clear call to action to the constituents of the digital advertising ecosystem: for advertising dollars to continue to flow, A TRANSPARENT, CLEAN AND PRODUCTIVE DIGITAL MEDIA SUPPLY CHAIN is paramount¹.



LAUNCH OF OPENAP

Turner, Viacom, and Fox launched a platform that ENABLES CROSS-PUBLISHER AUDIENCE TARGETING AND INDEPENDENT MEASUREMENT³. This is the first attempt at such a platform, and is open to all publishers that wish to join. Beyond the added scale of combined inventory, it aims to provide consistent cross-publisher segment definitions, secure sharing of segment data, and third-party verification.



LAUNCH OF HULU LIVE TV

The rise of virtual MVPDs continued as Hulu launched a live TV service, following a similar move by YouTube TV in April, to compete with the likes of Dish's Sling and AT&T's DirecTV Now⁶. Analysts estimated that **VIRTUAL MVPD SUBSCRIPTIONS TOPPED 5.3**⁷ **MILLION VIEWERS BY THE END 0F 2017**, and forecasted they would represent 14% of viewership by 2030⁸.



ESTABLISHMENT OF THE EUROPEAN BROADCASTER EXCHANGE (EBX)

Mediaset Group (Italy and Spain), TF1 Group (France), and ProSiebenSat.1 (Germany) established the EBX

TO ADDRESS THE DEMAND FOR BRAND-SAFE ENVIRONMENTS AND HIGH-QUALITY PAN-EUROPEAN VIDEO CAMPAIGNS AT SCALE. The

initial focus is on programmatic management of digital advertising purchases and sales⁹. Channel 4 joined this collaboration in November 2017.



After extensive consultation with a broad range of industry stakeholders, The European Viewability Steering Group (EVSG) launched a comprehensive European Viewability Certification Framework. The goal is to

REDUCE DISCREPANCIES IN DATA BY DIFFERENT VIEWABILITY MEASUREMENT

TOOLS¹¹. Similar efforts are underway in the U.S. with the MRC and IAB Toreleasing preliminary digital virumeasurement guidelines in C



NIELSEN EXPANDS MEASUREMENT COVERAGE FOR DIGITAL PLATFORMS

Nielsen announces that it will add programming from Hulu and YouTube TV into its overall TV ratings. As viewers migrate away from linear viewing, **MEASUREMENT FIRMS ARE ACTING TO BROADEN THEIR OFFERINGS TO DIGITAL.** Nielsen's President of Product Leadership, Megan Clarken left open the possibility of adding other streaming services "The doors are open for those players who want to be...measured in a comparable way to traditional TV"10.



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JUL

AUG



scripted shows. According to FX research **THE NUMBER OF ORIGINAL SHOWS HIT 487 IN 2017, AN INCREASE OF 69% SINCE 2012.** Streaming services, the fastest growing segment, accounted for 117 of the 487 programs in 2017¹².



FEDERAL COMMUNICATIONS COMMISSION (FCC) VOTES TO END THE OPEN INTERNET ORDER

The FCC ended 'net neutrality', which means

THE FEDERAL GOVERNMENT WILL NO LONGER REGULATE HIGH-SPEED INTERNET DELIVERY

as they do utilities. Ajit Pai, the FCC chairman, said that he expected the changes to help consumers as a wider choice of service options would become available¹³.

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2017 CORE OBSERVATIONS

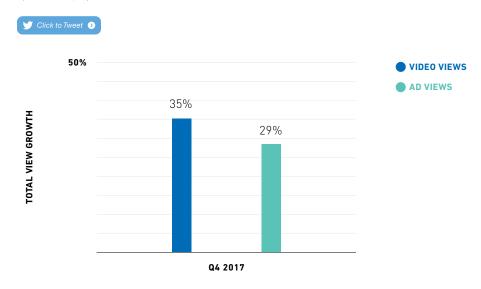
THE MOST COMPREHENSIVE DATA AVAILABLE ON PREMIUM VIDEO

WITH SPECIAL YEAR-END INSIGHTS



TOTAL VIDEO AND AD VIEW GROWTH, U.S.

Q4 2016 vs Q4 2017



OVERALL MARKET

PREMIUM VIDEO GROWS EVEN AS UNDERLYING COMPLEXITY INCREASES

For the full-year 2017, video views grew by 26% and ad views grew by 22%, continuing a multi-year upward trend. From a content perspective, 2017 saw record levels of investment. The number of original scripted shows rose to 487, up from 455 in 2016 and 216 in 2010¹⁴, showing that even non-traditional players recognize that premium content is a key mechanism to engage viewers. While long-form content constituted over half of ad view share in the fourth quarter, live content share grew the most, rising to almost a third of all ad views.

Beyond what to watch, consumers are demanding choice and flexibility in how to watch. While millennial viewership on traditional linear TV is falling by about 4.5% per year¹⁵, many viewers took advantage of growing TV Everywhere offerings as part of cable

subscriptions, as well as purchasing 'skinny-bundles' through virtual MVPDs, leading to a doubling of MVPD syndication in the fourth quarter.

Major brands reaffirmed their acknowledgment of video as the core of engaged advertising, but they also raised quality concerns. At the IAB Annual Leadership Meeting, advertisers demanded a transparent, clean and productive digital media supply chain¹⁶. Most of the concerns around ads being placed next to inappropriate content or being intrusively thrust on viewers, stem from the wider digital advertising ecosystem. This presents an opportunity for premium video: if publishers deliver engaging and brand-conscious user experiences, they are well positioned to capture digital advertising dollars.

Video views grew by 26% and ad views grew by 22%, continuing a multi-year upward trend.

^{14. &}quot;487 Scripted Series Aired in 2017, FX Chief John Landgraf Says," (January 2018). Retrieved at http://variety.com/2018/tv/news/2017-scripted-tv-series-fx-john-landgraf-1202653856/

^{15. &}quot;The State of Video," (November 2017). Retrieved at https://www.groupm.com/news/groupm-releases-state-of-video-report

^{16. &}quot;IAB Annual Leadership Meeting, Publishers & Platforms: What's Next?" (January 2017). Retrieved at https://www.iab.com/events/iab-annual-leadership-meeting-2017/

CONTENT

LIVE VIEWING COMES TO DIGITAL

By the end of 2017, full episodes and live streams together comprised 84% of premium video ad views, compared to 68% in 2016. Premium video, across end-points, moved significantly towards a TV-style experience.

Full-episodes constituted 53% of ad view share in Q4 2017, 96% of which occurred on entertainment content. The industry views premium long-form content as the key mechanism to deliver engaged viewership. Streaming companies are being particularly aggressive, investing billions of dollars in premium content¹⁷.

While long-form content comprised over half of ad views, live content share rose to 31%, representing the fastest growing segment. Sports dominated live content viewing, accounting for 77% share of ad views, predominantly focused on high-profile

events. These events are powerful as they deliver large, highly engaged, audiences and help drive technological innovation. Super Bowl LI marked an important milestone, as Fox delivered national and local affiliate ad streams across all digital platforms using FreeWheel's HyLDA technology. Digital streams mirrored the national TV ads, while inserting custom local ads based on the affiliate market. There will be ongoing focus on the live sport experience moving into 2018 due to marquee events like the Winter Olympics and FIFA World Cup.

In Q4, clips constituted 52% of video view starts, but only 16% of ad views, which aligns with publishers' focus on decreasing ad clutter around short form content. Many publishers are using clips to drive awareness and engagement with their more immersive long-form and live content.

17. "Netflix Says It Will Spend Up to \$8 Billion on Content Next Year," (October 2017). Retrieved at https://www.nytimes.com/2017/10/16/business/media/netflix-earnings.html



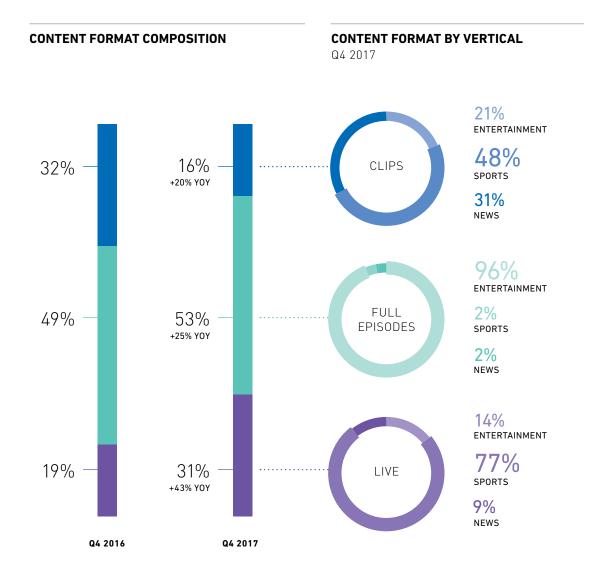
CHART 2

CONTENT COMPOSITION AND GROWTH BY FORMAT, AD VIEWS, U.S.

Q4 2016 vs Q4 2017



- **CLIPS** (0-5MIN.)
- FULL-EPISODES (5+ MIN.)
- LIVE



CONTENT

THE BIG SCREEN ADVANCES, BUT VIDEO REMAINS MULTI-SCREEN

Viewership continues to shift towards the big screen, with the share of OTT and STB VOD's combined ad views growing to 50% this quarter.

OTT devices take the top spot with 31% of share in a relatively fragmented market. The format is optimized for viewers and advertisers alike, as it provides the lean-back user experience of traditional TV while leveraging the strength of digital marketing. According to FreeWheel's Signature Insights: The Power of OTT, 75% of OTT ad views on entertainment content are in demo, and viewership is highest amongst the coveted 18-34 demographic 18. However, challenges remain for the format as devices don't yet support the same level of audience and viewability validation as mobile and desktop devices.

A significant share of growth this quarter was driven by STB VOD, which grew at 35% to represent 19% of premium video ad views. Much of this growth can be attributed to technology enhancements for ad delivery on STB VOD inventory. Canoe, a joint venture between Comcast, Cox, and Charter, enables programmers to dynamically insert ads into cable VOD inventory. In 2017 an integrated platform was released, with various feature improvements including upgraded inventory management controls and the ability to transact programmatically on STB VOD inventory.

The overall composition of device monetization remains fragmented, as viewers demand access to a multi-screen experience. Over the last three years OTT and STB have grown significantly, largely at the expense of desktop. While still an important device, representing 22% of ad views, it is ultimately being replaced by the more engaging big screen experience. The smartphone remains a more versatile viewing device and experienced 45% growth in Q4 to capture 19% of ad view share.

A significant share of growth this quarter was driven by STB VOD, which grew at 35% to represent 19% of premium video ad views.

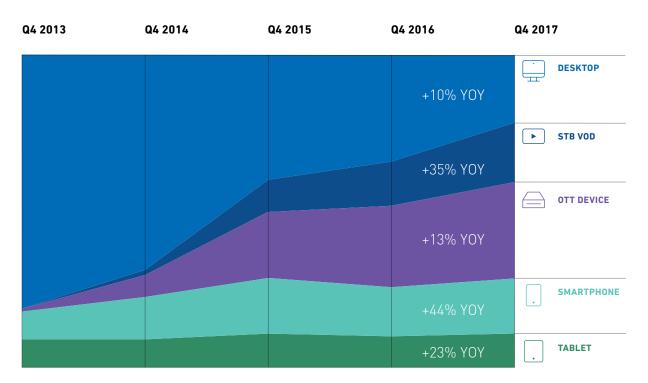
18. "Signature Insights Volume 1: The Power of OTT," (August 2017). Retrieved at http://freewheel.tv/insights/#signature-insights

CHART 3

AD VIEW COMPOSITION AND GROWTH, BY DEVICE, U.S.

Q4 2013 — Q4 2017





COMPOSITION SHARES BY QUARTER

| Q4 2013 | Q4 2014 | Q4 2015 | Q4 2016 | Q4 2017 |
|---------|---------|---------|---------|---------|
| 81% | 69% | 40% | 34% | 22% |
| _ | 1% | 10% | 14% | 19% |
| 2% | 8% | 22% | 27% | 31% |
| 10% | 15% | 19% | 17% | 19% |
| 7% | 7% | 9% | 8% | 9% |

CORE OBSERVATIONS

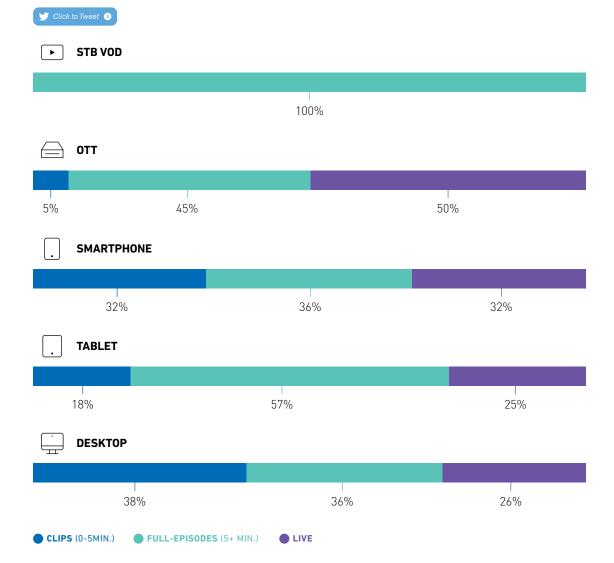
The type of content consumed on each device followed the same fragmented pattern as overall device type viewership, driven by the same underlying force: user choice.

The smartphone is the most multi-functional device with an almost equal composition of ad viewership across clips, full-episodes and live:

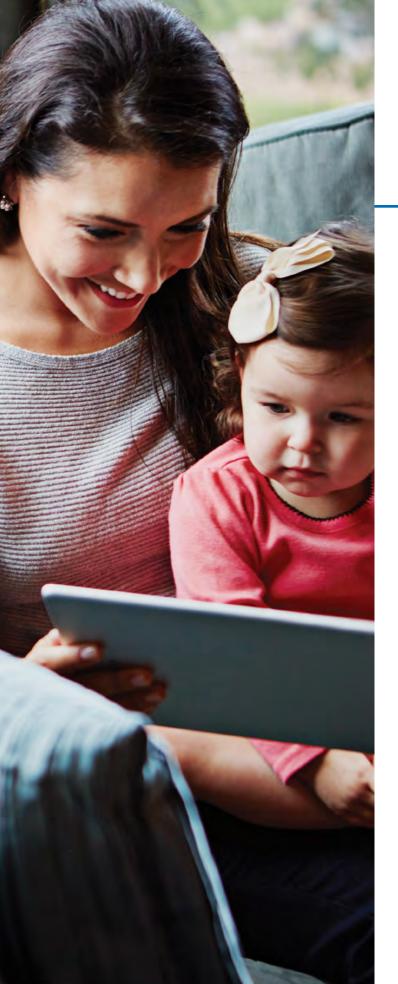
32%, 36%, and 32% respectively. Mobile is a multi-content-length device and it would be a mistake to pigeonhole it as a clip-only platform. However, along with tablet and desktop formats, it is important that publishers optimize clip viewing experiences on smartphones to help drive viewers to their full-episode and live content.

FORMAT COMPOSITION BY DEVICE, AD VIEWS, U.S.

Q4 2017







DISTRIBUTION

STRONG GROWTH IN 'PREMIUM SYNDICATION'

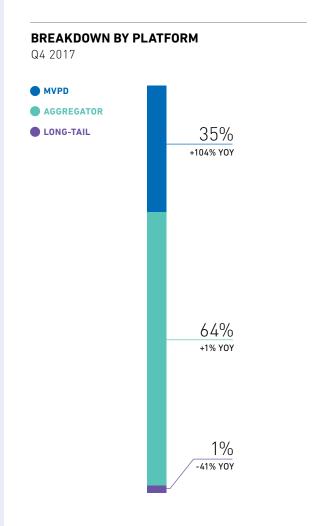
Publishers use syndication to generate additional revenue on content and build incremental reach. One of the major trends observed in 2017 was the growth of viewership through MVPD platforms. By the end of the fourth quarter, the syndication rate was 27% compared with 12% at the end of 2016, and MVPD use was up 104% year-over-year. The majority of this growth was driven by existing cable subscribers accessing TV Everywhere capabilities of their providers. However, a major contributing factor was the growth of virtual MVPDs. Both Hulu and YouTube launched live TV offerings to compete with the likes of Dish's Sling or AT&T's DirectTV Now. Virtual MVPDs ended 2017 with 5.3 million subscribers, exceeding earlier analyst projection of 4 million subscribers¹⁹.

In contrast to the strong MVPD growth, content distribution through aggregators was flat. Publishers steered away from distributing content on these sites and instead focused on owned and operated platforms (O&O). This gives them greater influence on the viewing and ad experiences, as well as enhanced control of customer data. However, driving O&O growth also requires investments in technology, marketing, and organizational capabilities.

Using existing cable network MVPD relationships has helped publishers to monetize content, at scale, using safe and trusted channels.

19. "Virtual MVPDs Ended 2017 with 5.3M Subs: Study," (February 2018). Retrieved at http://www.multichannel.com/news/content/virtual-mvpds-ended-2017-53m-subs-study/418107

YEAR-END INSIGHTS CHART 5 **SHARE AND GROWTH OF AD VIEWS** BY SYNDICATION PLATFORM, U.S. Click to Tweet 🧿 **TOTAL VOLUME OF AD VIEWS, U.S.** $27\% \\ \text{Syndicated}$ Q4 2017 +17% YOY 12% SYNDICATED Q4 2016 15% SYNDICATED Q4 2015 13% SYNDICATED Q4 2014



MONETIZATION

PUBLISHERS DELIVER VALUE FOR ADVERTISERS

According to the IAB, digital video spend for 2017 was estimated at \$9.4bn, up 67% from 2015²⁰, leaving little doubt that digital video is a fundamental and growing part of the advertising ecosystem. All major industries are represented within premium video advertising, the top five of which accounted for 71% of ad views in Q4 2017. For the first time in 2017, retail replaced CPG as the top advertiser, reflecting the impact of the holiday season in which retailers look to generate large portions of their annual revenues.

As advertisers increasingly engage with premium video, publishers and tech vendors must ensure their needs are met to maintain growth. In a 2017 survey led by the FreeWheel Council for Premium

Video (FWC), 242 brands and agencies agreed that the maturity of the digital video supply chain was top of mind. Two of the top six challenges facing the video industry were inadequate cross-screen metrics and how to reach millennials.

2017 saw publishers launch initiatives to provide enhanced products and services to strengthen their value proposition to advertisers. Of particular note was NBCU's announcement that they would measure viewing of the Winter Olympics using Total Audience Delivery²¹. This approach seeks to aggregate viewership across all linear and digital end-points, guaranteeing advertisers will reach viewers wherever they are watching.

20. "IAB Video Ad Spend Study," (April 2017). Retrieved at https://www.iab.com/wp-content/uploads/2017/05/2017-IAB-NewFronts-Video-Ad-Spend-Report.pdf
21. "Time for industry to embrace Total Audience Delivery," (December 2017). Retrieved at https://www.sportsbusinessdaily.com/Journal/ Issues/2017/12/04/Opinion/Lovinger.aspx?hl=NBC&sc=0

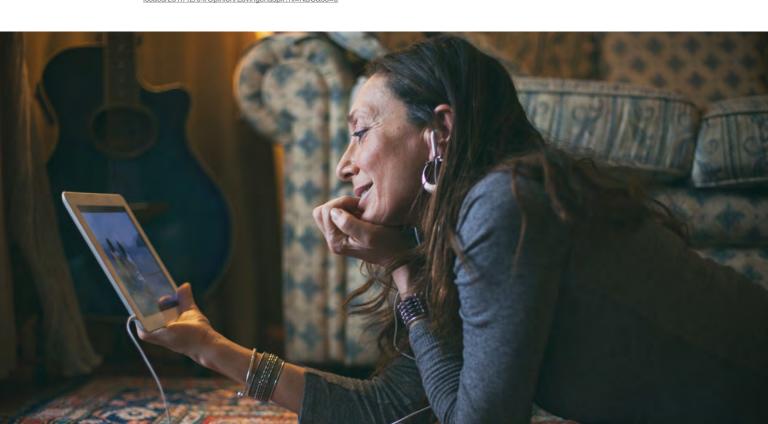


CHART 6

AD VIEW SHARE BY, ADVERTISER INDUSTRY, U.S. PROGRAMMERS

Q4 2017



| | 21% | RETAIL |
|----------|----------|--|
| | 18% | CONSUMER PACKAGED GOODS |
| D | 12% | ENTERTAINMENT & MEDIA |
| (-) | 11% | FINANCIAL & BUSINESS SERVICES |
| | 9% | AUTO |
| - | 8% | COMPUTING PRODUCTS |
| | 6% 5% | TELECOMMUNICATIONS QUICK SERVICE RESTAURANTS HEALTHCARE & |
| | 3% | PHARMACEUTICAL TRAVEL & LEISURE |
| | 1% | GOVERNMENT & NON PROFIT ENERGY, MANUFACTURING, UTILITY & INDUSTRIALS |

0%

EDUCATION

MONETIZATION

PROGRAMMATIC TRANSACTIONS SCALE WITH THE MARKET, BUT HEADWINDS REMAIN

Direct-sold deals dominate the premium video monetization market with 90% share versus 10% for programmatic transactions. This is similar to what was observed in 2016, as programmatic scaled with the overall market in 2017.

Premium publishers still rely heavily on their large ad sales forces to secure direct deals in digital, as they have in linear, but they are scaling up programmatic capabilities to access additional advertiser demand and to fill unsold inventory.

The ultimate goal is to allow advertisers to purchase inventory at scale through a cost effective and seamless delivery model. Several factors are holding back the accelerated growth of programmatic transactions:

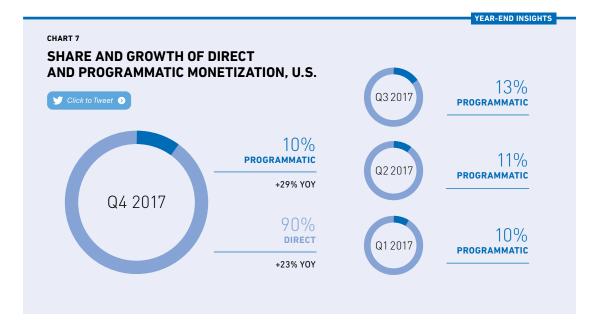
TECHNOLOGY The infrastructure to deliver programmatic transactions is still maturing. Mobile and desktop targeting and measurement capabilities are further along, but sourcing 'Device ID' level

information for newer formats like OTT devices is a work in progress. Real-time decisioning for programmatic ad insertion into live streams also remains technically challenging.

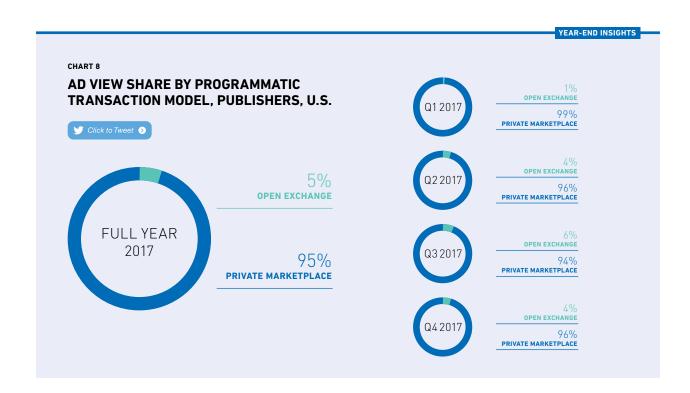
ORGANIZATIONAL CAPABILITY Publishers are at varying levels of maturity in building up the requisite skills within their sales and technology organizations to source and execute against programmatic advertiser budgets.

CLEAN TRANSACTIONS AND MEASUREMENT Both

advertisers and publishers remain cautious about user experience, brand safety and validated viewing. Technology players will strive for 'impression fidelity' ensuring ads are viewable on screen, are seen by real eyeballs, and are only delivered by authorized parties. Commitments to transparency initiatives like the IAB's Ads.txt²², as well as industry wide measurement principles will help.



22. "ADS.TXT - Authorized Digital Sellers." Retrieved at https://iabtechlab.com/ads-txt/



The industry has settled on a 'private deals through programmatic pipes' model.

In an analysis of the programmatic model using FreeWheel Markets data for full year 2017, 95% of transactions occurred in private marketplaces, demonstrating that the industry has settled on a 'private deals through programmatic pipes' model. In this model, portions of inventory are offered to one or more known buyers via programmatic transactions. Automation efficiencies around

campaign set-up and workflow can be realized, while maintaining greater creative control, and therefore brand safety.

In stark contrast to digital display advertising, an open exchange format has never comprised more than 6% of programmatic transactions in premium video, and there is little evidence that it will gain traction.

AD EXPERIENCE

THE DELIVERY OF ENGAGING ADS COMES INTO FOCUS

In a consumer-centric viewership model both advertisers and publishers are interested in understanding the impact of the ad experience on the viewer. The ideal outcome for the advertiser is to create engagement through a compelling story linked to their brand. Linear TV viewing traditionally supported ads of 15 to 60 seconds length. In July 2017, comScore noted in a study that, "Millennials only have a five-second attention span for ads."²³ Throughout 2017, there has been an

increasing focus on shorter ad lengths as a means to maximizing ROI for advertisers, while minimizing impact on the viewer experience. Of particular note has been the rise of six-second ads led by publishers like Fox²⁴.

Expect continued experimentation with the ad experience to continue in 2018, as the video ecosystem looks to balance the needs of publishers, advertisers, and viewers.

AD EXPERIENCE

ENGAGEMENT DRIVES AD COMPLETION

Premium video ad completion rates, measured as percentage of ads that finish once started, remain high for both pre-rolls and mid-rolls. Across pre-roll ads, both long-form and live content have a completion rate of 87%, compared to 73% for clips,

reflecting a viewer's greater investment in getting to TV-like content. Mid-roll completion rates, are even higher at 92% and 96% for long-form and live content respectively, reflecting the high engagement levels generated by premium video.

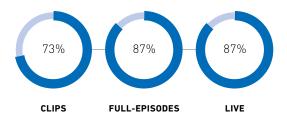
CHART 9

AD COMPLETION RATES BY AD UNIT AND CONTENT DURATION, U.S.

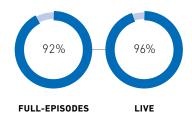
Q4 2017



PRE-ROLL



MID-ROLL



- 23. "Millennials only have a 5-second attention span for ads, says comScore CEO," (July 2017). Retrieved at https://www.cnbc.com/2017/07/21/comscore-ceo-millennials-need-5-to-6-second-ads-to-hold-attention.html
- 24. "Fox Networks Group Follows YouTube's Lead in Adopting 6-Second Ad Format," (June 2017). Retrieved at http://www.adweek.com/tv-video/fox-networks-group-follows-youtubes-lead-in-adopting-6-second-ad-format/

AD EXPERIENCE

AD LOADS REMAIN STABLE AS PUBLISHERS EXPERIMENT

In the face of alternative subscription fee models, publishers have been experimenting with ad load to balance viewer experience with monetization. Turner, Fox and NBCU have all announced commitments to cut ad loads. Most recently, Fox set a target to reduce ad time to two minutes per hour²⁵ and NBCU announced it would cut primetime ads by 20% across its TV footprint²⁶. Despite this, net ad loads across the premium video market have, to date, remained stable. For instance the average ad load for mid-roll breaks (measured for full-episode content) remained between 3.9 and 4.1 ads for the entirety of 2017.

The same stability is observed for pre-roll ads played prior to clips. The average clips-to-ads ratio has been 1.8 to 2.0 across 2017 and was 1.8 in the fourth quarter (meaning for every 1.8 clips, one ad is watched). According to research in the FWC's paper: The Short-Form Video Ad Experience, viewers would expect a higher ratio of 1.3 clips-to-ads²⁷, so there may be room for higher ad loads.

CHART 10

AVERAGE NUMBER OF ADS PER MID-ROLL BREAK, FULL-EPISODES, U.S.

Q4 2017

Click to Tweet 🧿

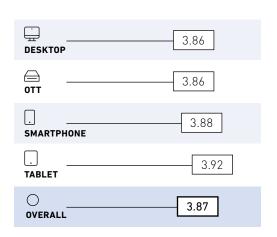


CHART 11

AVERAGE RATIO OF PRE-ROLL ADS TO VIDEOS, CLIPS, U.S.

Q4 2017



^{25. &}quot;Fox Wants to Reduce Ad Time to Two Minutes per Hour by 2020," (March 2018). Retrieved at https://www.wsj.com/articles/fox-wants-to-reduce-ad-time-to-two-minutes-per-hour-by-2020-1520334000

^{26. &}quot;NBCUniversal Vows to Cut Primetime Ads 20% Across All TV Networks," (February 2018). Retrieved at http://variety.com/2018/tv/news/nbcuniversal-nbc-advertising-cut-primetime-ad-load-1202712956/

^{27. &}quot;The Short-Form Video Ad Experience," (August 2017). Retrieved at http://freewheel.tv/fwcouncil/#freewheel-council-positions

AD EXPERIENCE

FULL-EPISODE AD REPETITION RATES FALL

After load, ad repetition is the second most important ad experience control lever. Some amount of repetition is acceptable and indeed can be beneficial to the advertiser; however high repetition rates are detrimental to the viewing experience.

Throughout 2017 ad repetition rates slowly dropped, and by the end of the fourth quarter 86% of full-episode content had no ad repeats, compared with 77% at the end of the first quarter.

In contrast, the picture for live content is one of higher ad repetition rates that have remained stable around 60% throughout the year. Sports dominated the live segment, and sponsorship deals often lead to the same advertiser appearing multiple times while longer average viewing sessions increased the likelihood an ad will repeat.

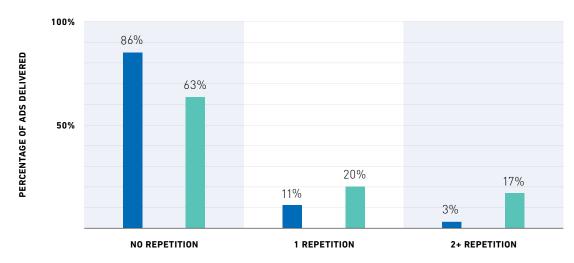
Throughout 2017 ad repetition rates slowly dropped, and by the end of the fourth quarter 86% of full-episode content had no ad repeats.

CHART 12

AD REPEAT FREQUENCY PER STREAM
BY CONTENT FORMAT, U.S.

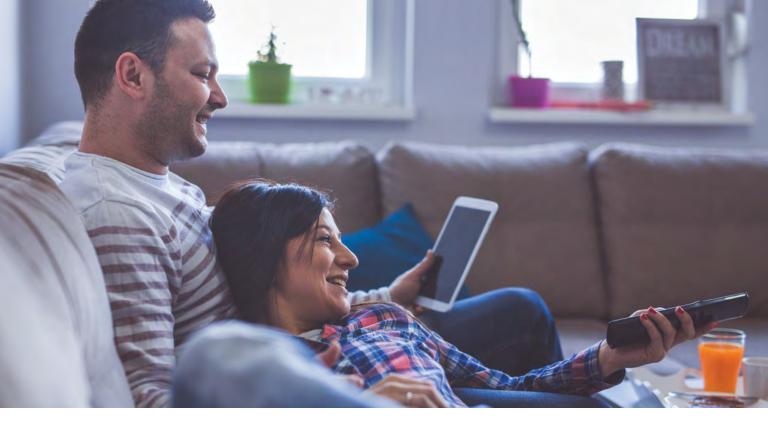
Q4 2017

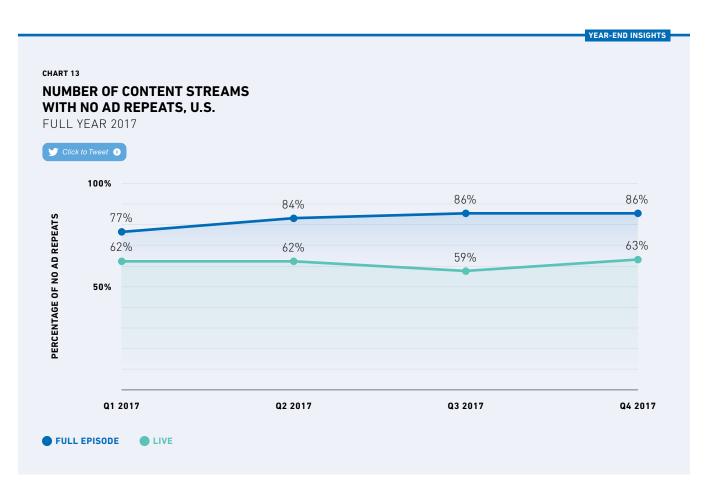




● FULL EPISODE

LIVE









2017 CORE OBSERVATIONS

THE MOST COMPREHENSIVE DATA AVAILABLE ON PREMIUM VIDEO

EUROPE

INTRODUCTION

Advertisers are increasingly looking to their digital channels to maximize returns. In a world of media fragmentation, premium video provides a much needed method of capturing audience attention. To advocate on behalf of European premium video publishers, the FreeWheel Council for Premium Video, Europe (FWCE) was launched in 2017, with fourteen inaugural members²⁸. In its first white paper, the European Council outlined the advantages of premium video when compared to other video environments within Europe²⁹. The group followed with a paper on defining a video view and in early 2018, a robust snapshot of the players providing measurement standards for video advertising across Europe.

The overall market figures show video views grew 10% in the fourth quarter, but ad views grew faster, at 20%, for the second quarter running

Premium video has inherited many of the strengths of TV advertising, including high engagement with both publisher content and the advertising that appears alongside it, virtually fraud-free transactions, and an environment subject to

rigorous quality and transparency checks to ensure a safe environment for brands. Alongside the increased reach and frequency premium video delivers, these factors explain why 2017 ended with promising trends that were persistent throughout the year:

- GROWTH IN VIEWERSHIP as premium publishers continue to address consumer demand to watch content wherever and whenever they want.
- INCREASED MONETIZATION in premium publishing environments across all devices and all content lengths.
- STRENGTHENED PARTNERSHIPS across premium publishers, as well as between publishers and operators, to address issues of scale and audience fragmentation.
- A CONTINUED DRIVE towards quality as premium publishers carefully balance monetization and viewer experience, striving for the optimum yield to retain and grow audiences.

The overall market figures show video views grew 10% in the fourth quarter, but ad views grew faster, at 20%, for the second quarter running. Ad views for clips more than doubled this quarter leading to an increased share of the total market. Ad view growth was further driven by monetization of live content, as publishers increased the volume of live content available across all devices.

^{28.} Similar to the FWC in the U.S, it is an advocacy group, comprised of 14 members, including programmers and operators across Europe. The FWCE serves the collective interest of those in the premium video industry through leadership positions, research and advocacy promoting the premium video economy.

^{29. &}quot;Why Premium Video Matters for Advertisers: A European Perspective," (June 2017). Retrieved at http://freewheel.tv/fwcouncil/#freewheel-council-positions

CHART 14

TOTAL VIDEO AND AD VIEW GROWTH, EUROPE

Q4 2016 vs Q4 2017



VIDEO VIEWS

AD VIEWS

20%
10%
Q4 2017



MONETIZATION INCREASES ON CLIPS EVEN AS PUBLISHERS CONTROL THE LONG-FORM AD EXPERIENCE

Continuing the trend of previous quarters, the highest ad view growth came from clips, which grew 119% year-over-year in Q4 and represented 21% of the market. Publishers also continued to increase the volume of available long-form and live content with the latter up 30% year-over-year to represent 4% of the market.

Long-form ad views remained largely flat despite video view growth, as publishers sought to

prioritize the user experience. Live content showed strong double-digit growth in both video and ad views increasing 45% and 30% year-over-year respectively. This reflects the growth potential in live viewing, similar to the U.S. market, as technology scales in Europe. Ad view growth lagged video views, as in previous quarters, as publishers maintain strict control over ad loads in premium video environments.

CHART 15

AD VIEW COMPOSITION AND GROWTH BY CONTENT DURATION, EUROPE

Q4 2017

Click to Tweet 🧿

■ CLIPS (0-5MIN.)

■ FULL-EPISODES (5+ MIN.)

LIVE

Live content showed strong double-digit growth in both video and ad views increasing 45% and 30% year-over-year respectively

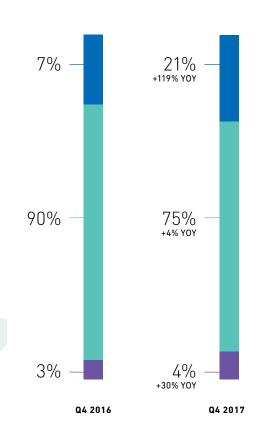


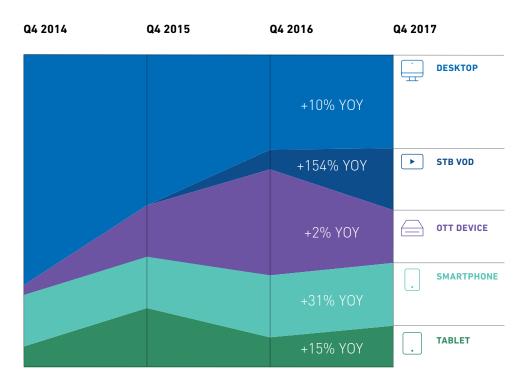


CHART 16

AD VIEW COMPOSITION AND GROWTH, BY DEVICE, EUROPE

Q4 2014 — Q4 2017





COMPOSITION SHARES BY QUARTER

| Q4 2014 | Q4 2015 | Q4 2016 | Q4 2017 |
|---------|---------|---------|---------|
| 78% | 48% | 31% | 30% |
| - | - | 10% | 20% |
| 3% | 17% | 24% | 17% |
| 12% | 16% | 15% | 20% |
| 7% | 19% | 20% | 13% |

THE BIG SCREEN TAKES TOP SPOT FOR PREMIUM VIDEO VIEWING

For the first time the big screen leads the market in Europe, with STB and OTT collectively at 37% share. Q4 saw growth of 154% year-over-year in ad views on STB VOD, which ended with 20% market share. OTT's share of ad views stood at 17%, up 2% year-over-year. Historically, STB's share of ad views trails that of OTT, as publishers have taken advantage of the shorter technology enablement cycle of OTT in their move towards digital transformation. However, operators in Europe, in a drive to boost customer retention, have brought more IP-enabled STBs to the market in the race to be a triple-play or quad-play provider with attractive content offerings.

Nonetheless, OTT services remain attractive to premium publishers as they complement their offerings and allow incremental revenues whilst also reaching a broader audience. Increased OTT viewing and monetization is set to remain strong into 2018 and beyond, with Kagan, projecting the market to reach \$6.8 billion in revenues in 2022, up from \$3.9 billion in 2017³⁰.

Smartphone ad viewership grew at 31% year-overyear, and collectively mobile and tablet screens have overtaken desktop in share of ad views as consumers move to platforms more conducive to viewing content anywhere. This is expected to continue to drive ad views as publishers seek revenue from new content distribution avenues as consumers shift viewing to portable devices.





PUBLISHERS EXTEND REACH THROUGH SYNDICATION

Syndication took a step closer to the shares seen in the U.S., growing to 17% in Q4 2017. Historically ad views have been on broadcaster O&O platforms as premium publishers sought to increase content distribution while retaining primary sales rights. This quarter, syndication grew 74% year-over-year as viewers and publishers took advantage of technologies to extend content reach, particularly IPTV in the French broadcasting market. Operators accounted for 92% of syndication as premium publishers sought to limit distribution of their content on aggregator sites.

Within Europe, broadcasters and operators continue to work together to maximize revenue from broadcaster inventory. June 2017 saw Sky join forces with Virgin Media to roll out Sky's

AdSmart audience targeting platform. As a result, AdSmart will be extended to more than 30 million viewers in the U.K. and Ireland. Operators took the lion's share of syndicated ad views and grew 70% last year. Furthermore, aggregators showed strong growth in ad views, up 42% year-over-year, as they continued to curate publisher content appealing to their customer base. This looks set to continue as premium publishers and operators work on how best to share the revenue of addressable TV advertising.

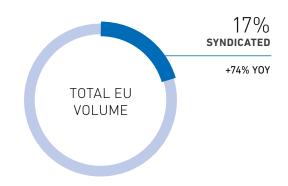
Whilst long-tail share remains under 5%, it has shown strong growth year-over-year but retains 2% share of ad views. Growth has largely been a result of increased syndication to news sites within Europe.

CHART 17

SHARE AND GROWTH OF AD VIEWS BY SYNDICATION PLATFORM, EUROPE



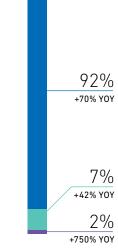
TOTAL VOLUME OF AD VIEWS, EUROPE



BREAKDOWN BY CHANNEL

Q4 2017



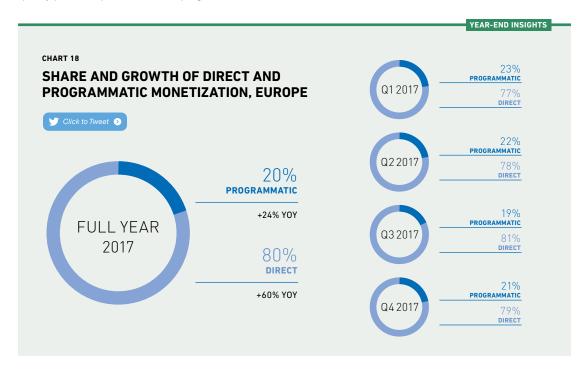


PREMIUM PUBLISHERS WORK TOGETHER TO MOVE THE INDUSTRY FORWARD

For the full year 2017, the balance remains firmly 80:20 in favor of direct-sold inventory for premium broadcasters in Europe, which held over all quarters. In 2017, programmatic ad views increased 24%, a lower level of growth than the 60% of direct-sold deals. The fourth quarter saw a drop in programmatic ad view share year-over-year as premium publishers focused on direct sales efforts, which aligns with heavy Q4 seasonal advertiser spend requiring guaranteed delivery. More broadly, premium publishers are increasingly collaborating to drive monetization through programmatic channels.

The European Broadcasters Exchange³¹ was established in September 2017 to address the demand for brand-safe environments and high-quality pan-European video campaigns at scale.

In addition, leading European broadcasters and measurement experts partnered to build a multinational cross-platform data consortium to address advanced targeting, audience profiling, viewability, and attribution³². Furthermore, within the U.K. there is public collaboration between broadcasters to champion addressable TV advertising together³³. At the New Video Frontiers conference held in London in October 2017, Jamie West, Deputy Managing Director of Sky U.K.'s ad sales arm, Sky Media said that "though there is an evolving appetite in his company for pan-regional ad sales partnerships, it is only now starting to develop." 2018 expectations are that publishers will continue to leverage their joint ventures to increase the availability of inventory and improve automation and targeting.



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PREMIUM PUBLISHERS CONTINUE TO KEEP AD LOADS IN CHECK

We continue to see advertising loads within premium video content decline in Europe. Q4 saw a reduction of 1.32 ads per long-form break, translating to a reduction of 42 seconds per break. There are two reasons for this shift. First, premium publishers are rightly protective of the

viewer experience and seek to balance this with monetization. Furthermore, as targeted advertising becomes more sophisticated, publishers can command a higher return for their inventory and manage yield more effectively while optimizing ad loads for viewer experience.

CHART 19

ON-DEMAND FULL-EPISODE AD LOAD, EUROPE

Q4 2017

Q4 2017

ADS PER BREAK

Q4 2016

121

SECONDS

Q4 2017 CONCLUSION

Technological innovation enabled continued growth for premium video throughout 2017. OTT and STB VOD technology converged the linear and digital viewing experiences, while MVPD TV Everywhere offerings delivered flexibility for viewers. At the same time, advertisers and agencies demanded more premium video inventory, leading to greater creative diversity and falling ad repetition rates. Programmatic transactions scaled with the market, with both advertisers and publishers seeing the benefits of this model, even while technical challenges remain.

Join us next quarter as we provide a first look into the 2018 insights, including the impact of two key tent pole events - Super Bowl LII and the Winter Olympics.

AUTHOR BIOS



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David Dworin leads FreeWheel's Advisory Services team, where he helps clients navigate the ever evolving premium video ecosystem. Prior to joining FreeWheel, David spent a decade leading growth strategy initiatives at leading agencies, consultancies, and professional services firms.



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Hasan Iqbal is a Senior Manager in FreeWheel's Business Advisory practice and helps clients generate insights through data-backed analyses. His areas of expertise include market benchmarking and analysis, revenue strategy, and scaling of organizational capabilities. Prior to FreeWheel, Hasan was a strategy consultant with PwC Strategy& where he advised media and technology companies.



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Kimberly Goughnour is a Senior Associate in FreeWheel's Product Advisory Practice. In this role, she works with media clients to provide tactical and strategic guidance to maximize their utility of the FreeWheel product suite. Her portfolio includes endpoint health analysis, new integration/feature implementation, and process optimization. Prior to working at FreeWheel, Kimberly managed programmatic campaigns at large agency trading desks and helped execute the go-to-market plan for VideoAmp's cross-screen video Demand Side Platform.



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Rebecca Rangeley is the Head of Business Insight for our International Business. In this role, she works across Comcast Technology Solutions (CTS) and Freewheel, using data analysis to support customer decision making and investments for clients. Prior to FreeWheel, Rebecca managed the Digital Insight Team at Sky Media in the U.K., delivering insights to drive Sky U.K.'s advertising revenue for VOD, online and mobile applications.

Special thanks to: Steven Rosenblum, Xu Yao, Esra Akturk and Alexander Groysman

AD COMPLETION RATE

Measures the percentage of ads that were completed once started

AD VIEW

An impression that is accrued after the first frame of an ad is displayed

AGGREGATOR

A high-traffic content aggregator, for example AOL or MSN

CONTENT VERTICAL

Content genre, e.g. news, entertainment, sports

DEAL ID

Unique deal identifier of a programmatic transaction that can be used to match advertisers and publishers directly

DIRECT-SOLD

Advertising deals made directly between a publisher and an advertiser

DYNAMIC AD INSERTION (DAI)

Process of dynamically inserting ads into a content stream, such that different ads can be inserted into the same ad break

FREEWHEEL COUNCIL FOR PREMIUM VIDEO (FWC)

Serves the interests of those in the premium video industry through leadership positions, research, and advocacy to promote the premium video economy

IMPRESSION

Occurs each time an ad is displayed. Synonymous with "ad view"

INVENTORY

An ad opportunity. A piece of inventory is filled by an ad impression

LINEAR

Traditional broadcast, cable, or satellite television

LONG-TAIL

Small scale/niche content aggregators

MID-ROLL

An ad break that occurs in the middle of content

MULTICHANNEL VIDEO PROGRAMMING DISTRIBUTOR (MVPD)

Provides pay TV services delivered either through broadcast satellite or cable TV. Examples include Comcast and Verizon

NEW LIVING ROOM

The same high-quality TV content that was traditionally consumed in the living room is experienced today by the same audience through a multitude of screens and locations

OPERATOR

Provides pay TV services in the EU, functioning similarly to MVPDs in the U.S. Examples include Sky U.K. and SFR

OVER-THE-TOP (OTT)

Viewing content delivered over an internet connection. Typically seen as OTT Device, which includes devices like Roku, Apple TV, Connected TVs, etc.

OVER-THE-TOP DEVICE (OTT DEVICE)

Viewing content delivered over an internet connection on a TV streaming device, including devices like Roku, Apple TV, Connected TVs, etc.

PRE-ROLL

An ad break that occurs before content starts

PREMIUM VIDEO

Video content that is professionally produced, rights managed, and limited in supply

PROGRAMMATIC

The use of automation software or managed services to execute an advertising deal

PROGRAMMER

U.S. publishers that generate the majority of their advertising revenue from linear TV services and offer a diverse content mix in digital environments as well

PUBLISHER

Producers or syndicators of content. Can be programmers or digital pure-plays

SET-TOP BOX VIDEO ON DEMAND (STB VOD)

Accompanies a cable/broadcast/satellite setup. Contains a cable input and outputs to a TV. Integrations via FourFronts STB VOD and Canoe Phase III

SIMULCAST

A digital stream of a live event that is simultaneously broadcast on linear TV

SYNDICATION

Viewing that occurs outside of a publisher's Owned and Operated properties or primary platforms

TV EVERYWHERE (TVE)

Apps that allow viewers to access content over the internet by logging in with their MVPD subscription credentials

VIDEO START

Accrued after the first frame of video content is displayed. Formerly referred to as video view

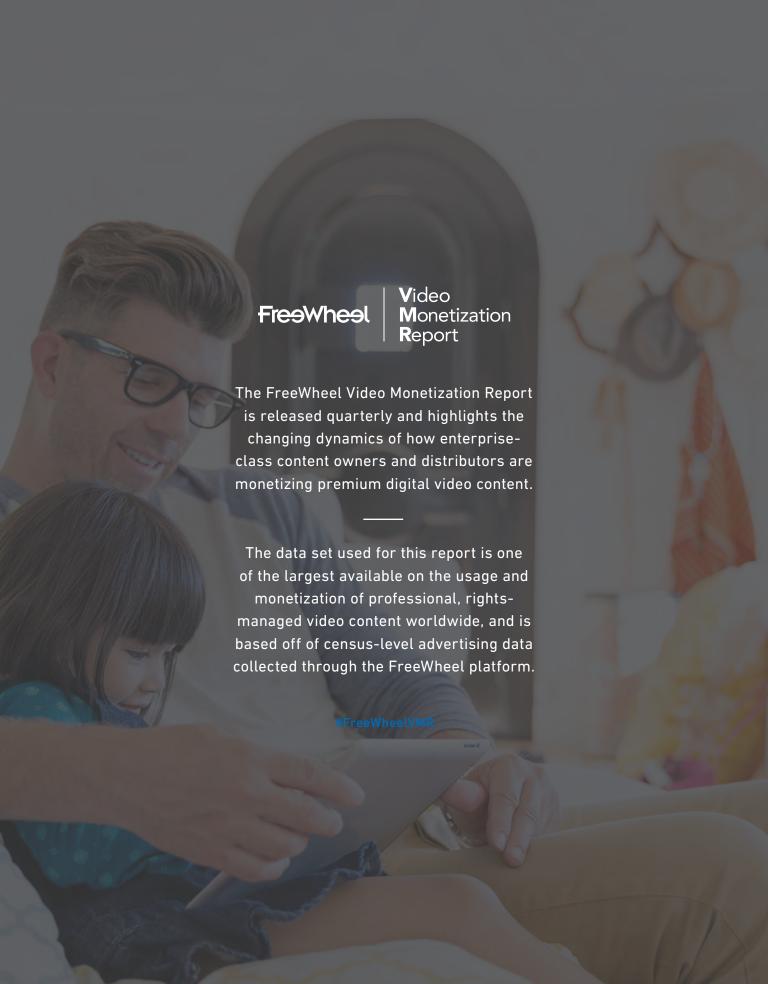
VIRTUAL MVPD

Digital-only cable alternatives that offer access to both live and on-demand premium video content for a subscription fee

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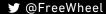
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Q4 2017

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