OOYALA

GLOBAL VIDEO INDEX

Q2 2018

TABLE OF CONTENTS

POINT OF VIEW

JIM O'NEILL, PRINCIPAL ANALYST

Few things set viewers' pulses racing as much as live sports — especially those that are global events like the World Cup, the Olympics, or of major national scope or even high-profile regional events. But even niche sports often have great appeal, albeit to a niche audience.

So how come the National Football League — the majordomo of professional sports leagues — wasn't alarmed when it kicked off its season with TV ratings measuring from so-so to downright bad? In the season's *Thursday Night Football* opener — the rematch of one of the best playoff games of the season last year, Philadelphia and Atlanta — 19 million viewers tuned in. That's 13% fewer viewers than last year's game between the Houston Texans and the Cincinnati Bengals, and the smallest Thursday night audience in 10 years.

Monday Night Football saw its lowest ratings since 2007, helping push down ratings on the opening seven games of the season about 1% from a year ago. It was the third straight year of declining viewership on opening week overall; total viewers were down 23% from 2015.

While a 1% decline may not mean the sky is falling for the NFL, there has been a decline in the average number of viewers per game for the past couple of seasons, from 17.4 million in 2013 to 14.9 million in 2017. And small declines can quickly turn into big ones — just ask the pay-TV industry in the United States.

OTT IS KEY TO RECAPTURING SPORTS ALLURE

But the NFL and sports organizations across the globe are not as worried by low TV ratings as you might think. Why? The potential to expand viewership — and revenues — by going over the top. Increasingly, viewers are watching on more than just traditional televisions. The NFL is putting all of its games online this year, making them available for the first time to viewers without requiring they be authenticated pay-TV subscribers.

Is it helping?

As the NFL season has gotten past the early-games doldrums, it's shown a *slight* rebound in its traditional TV broadcast ratings. Meanwhile, the league says it's seen a 65% increase on digital devices in the past year alone, including a 147% increase in mobile viewing (more on that later).

In week 4, for example, streaming via outlets like Amazon Prime Video, Fox, the NFL's online platforms, Twitch and Yahoo Sports, the Los Angeles Rams-Minnesota Vikings game saw an average minute audience of 816,000, the most ever for a Thursday Night Football game and an increase of 86% over the average for all 10 games last year.

And, it wasn't just that viewers tuned in to the game; they stayed, for about the same time as they would for a game on traditional TV.

"Fans aren't differentiating between a TV, tablet or phone," said David Jurenka, the NFL's senior vice president for digital media.

That extended viewing, despite the device, is something we wrote about a couple of quarters ago in the Q3 2017 Video Index. In terms of how long viewers watched major sports events streamed on various devices:

"Tablets actually kept viewers most engaged, with the average viewing time about 67% of the streamed event action. Computers were just off that mark, at 66%, with connected TVs next at 61%. Smartphones proved to be least effective at engaging viewers, despite being the device most often used to access the action. Viewers watched just 44% of event action on smartphones."

As to how often viewers started watching a live streamed sporting event, it should come as no surprise that mobile devices were the most popular; 18–49 year-old males tend to be the most enthusiastic sports fans as well as the most enthusiastic adopters of streaming to smartphones. We found that mobile accounted for nearly 63% of all sports starts.

That device democracy, a willingness to watch huge chunks of content on the device at hand, could be critical as broadcasters look to stop the erosion of viewers from sporting events that traditionally have been massive draws… the last kind of content that still can keep a viewer's attention for one, two and even three hours at a time.

The billion-dollar price tag for sports rights is showing some markdown pressure as declining attendance and ratings diminish sports value proposition. Consider: 2017 saw the third straight decline in ratings for the Super Bowl on traditional TV and marked the smallest audience since 2009.

As Andrew Zimbalist, who studies the business of sports, said in an interview earlier this year: the NFL is "basically treading water."

Could streaming be the lifeboat?

Brett Sappington, senior director of research at Parks Associates, said the splintering of sports rights likely will help leagues generate additional revenue streams.

"They can continue to increase their overall revenue intake by breaking their seasons into sub-packages, ultimately making it more affordable for distributors to win a part, if not all, of the rights for the season or postseason," he said. "This approach has allowed new players to enter the market, including online giants such as Facebook. In doing so, these new players have gained valuable experience in how they can best use and monetize live games, encouraging them to be more willing to purchase larger packages and exclusive rights, which some have done."

For its part, The NFL says it wants to use digital delivery to add more interactive, innovative features to attract new viewers and enhance the actual experience of watching the game.

Globally, all sports are facing a similar scenario, some seeing growth in revenues at the same time they're experiencing declining fan interest, ratings and attendance… a mixture of states similar to Schrödinger's cat.

OTT may be the turning point: simply making it easier to watch sports at any time, on any device and anywhere a fan wants to. As Sappington points out, OTT services allow even niche sports to accrue, market to, and monetize audiences in a way that was not economically feasible via broadcast TV.

Is it enough to make a difference?

Stay tuned.

Here are highlights of the Q2 2018 Global Video Index:

THE RISE OF MOBILE VIEWING

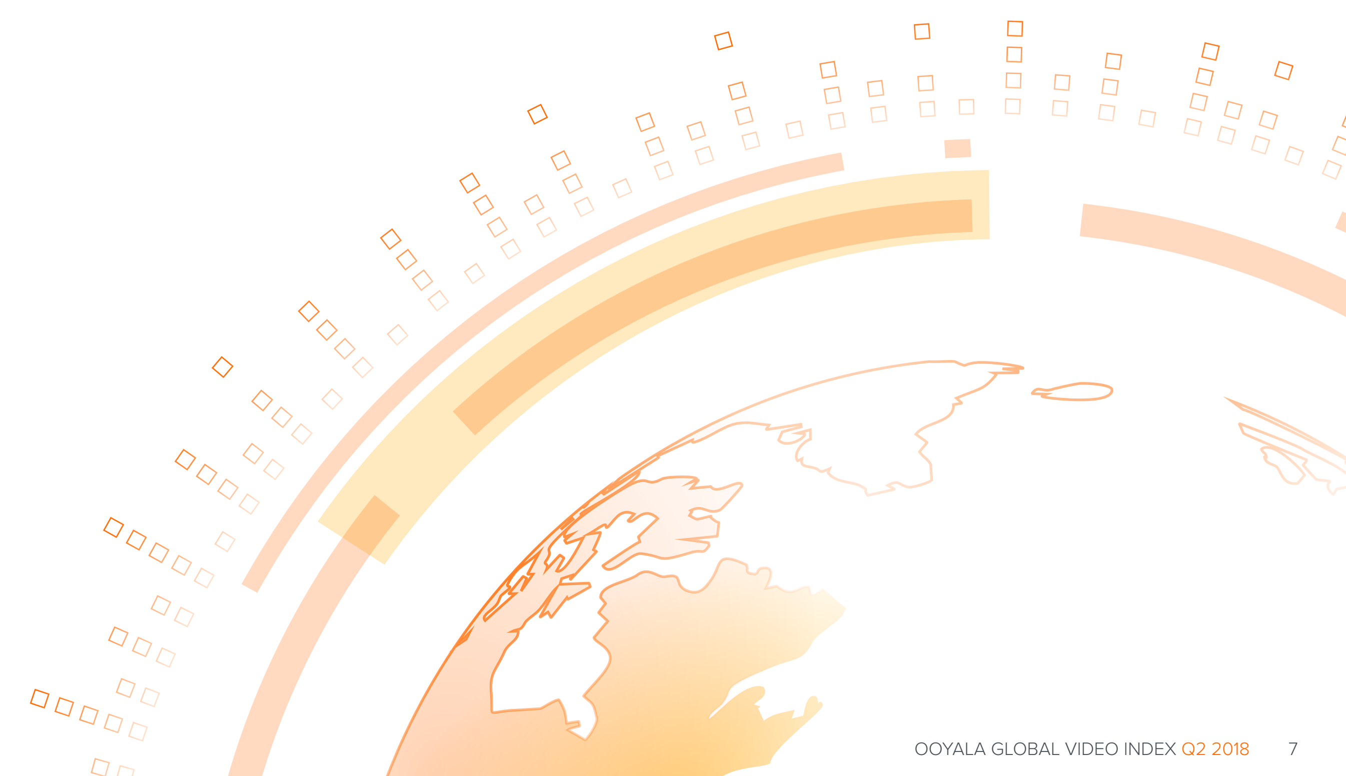
- The percentage of online videos viewed on mobile devices exceeded 62% for the first time
- It was only the second time mobile video starts exceeded 60%
- Mobile video starts on smartphones + tablets now have exceeded 50% for nine consecutive quarters
- Y/Y mobile plays were up 9.8% over Q2 2017, more than 5X Q1's Q/Q growth
- The share of smartphone video starts topped 50% for the first time ever in Q2, a 13.2% Y/Y change — the best in five quarters
- Video starts on tablets had a 10.1% share, the fifth consecutive quarter of double-digit share
- But: Video starts on tablets declined 5% Y/Y, the first such decline since Q3 2015
- As more premium content becomes available on mobile devices, mobile plays climb

GLOBAL MOBILE CONSUMPTION TRENDS

- EMEA mobile video starts hit 54% of all starts, up from 49% a year ago
- EMEA mobile video starts are up 26% in the past two years
- Mobile video's share of all plays in APAC was 74%, the highest ever, up 64% in two years
- If was the fifth consecutive quarter with mobile starts above 60% in Asia-Pac
- North America saw mobile plays increase to 56% of all starts, up 4% Y/Y and 14% since Q2 2016
- Mobile starts in North America have exceeded 50% for eight quarters
- LatAm's mobile starts topped 65%, an increase of 20% Y/Y and 38% over two years
- It was the second quarter in a row that saw mobile plays near or above 60%

ENGAGEMENT TRENDS

- Long-form content continued to dominate time watched on most screens in mature markets
- North America saw long-form time watched on smartphones top 75%
- EMEA saw long-form time watched on tablets top 57% and reach 33% on smartphones
- In APAC, time watched for long-form content topped 42% on tablets and 33% on smartphones
- Short-form time watched was dominant on every screen but connected TVs in LatAm



THE RISE OF MOBILE

After a modest year-over-year (Y/Y) gain in Q1, mobile starts in Q2 resumed their climb into nosebleed territory, with 62% of all video starts for Q2 2018 on smartphones and tablets, an increase of nearly 10% from Q2 2017 and up 8% from Q1 2018. Q2's Y/Y growth was more than 5X the Y/Y growth in Q1.

It was only the second time mobile had topped 60% in the history of the Video Index (it hit 60.3% in Q4 2017).

Smartphones played the leading role in the quarter's growth, racing into uncharted territory for the device. For the first time ever, smartphone share of video starts topped 52% in the quarter, up more than 13% Y/Y, the most in five quarters. The previous high for the device was 46.9% in Q1 2017. It was the biggest Y/Y percentage gain since Q1 2017, and the best Q2 Y/Y gain since 2015.

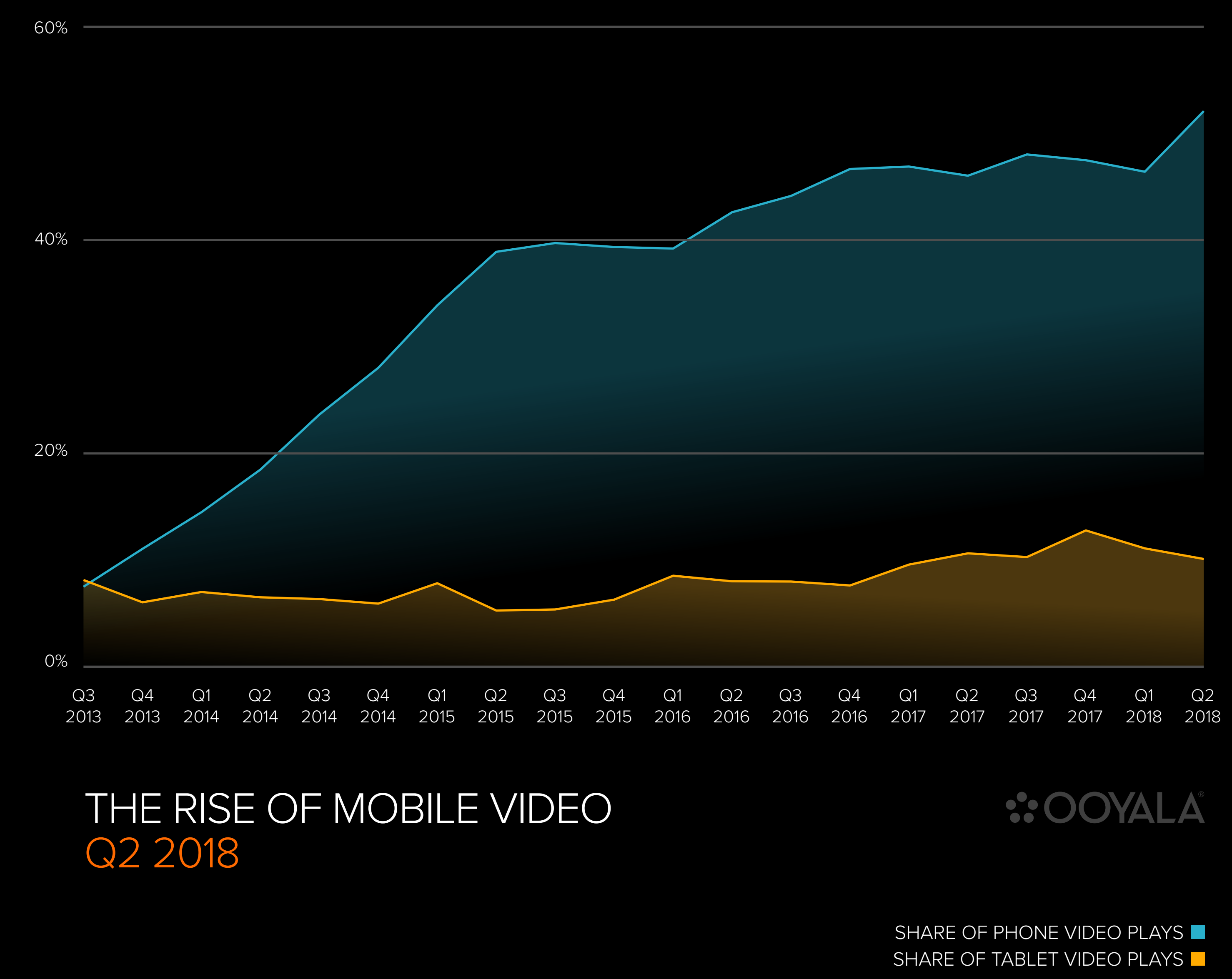
Tablet plays, meanwhile, took a supporting role, making up just more than 10% of all video plays, slightly down from a year ago. But tablet plays, which have made up just less than one-fifth of all mobile video starts for the past 11 quarters, maintained that fractional share, essentially stable at 16%.

The 62% is notable, a strong indication that content owners' commitment to digital delivery of content — and to make it available on mobile device especially — is growing as more consumers adopt over-the-top viewing. There are more than 220 over-the-top video services available to consumers in North America, and that number is dwarfed by the number of services available in the rest of the world (ROW), especially in emerging markets where it is far less expensive to light up or expand a mobile network than it is to expand a wired one.

In the U.S., wireless operators are continuing to expand their virtual bundles and — as in the case of AT&T — add new bundles. The telco recently announced plans to deploy a new streaming service based on content it acquired in its purchase of Time Warner. AT&T said the new service "will serve as a complement to our existing businesses," offering the WarnerMedia collection of films, television series, libraries, documentaries and animation.

"We expect to create such a compelling product that it will help distributors increase consumer penetration of their current packages and help us successfully reach more customers," AT&T wrote.

The service is set to launch in late 2019.



THE IMPACT OF NEXT-GEN 5G WIRELESS NETWORKS

Over the past two or three years, we've talked a lot about how 5G wireless networks will likely impact streaming. With potential for multi-gig delivery and hugely reduced latency the technology, which already is being tested in more than five dozen cities around the world, will dramatically change the way entertainment and sports are delivered. And it's already creating huge opportunity.

A new report commissioned by Intel, "**5G Economics of Entertainment Report**," forecasts that between 2019 and 2028 media and entertainment companies will be competing to win a share of a near $3 trillion cumulative wireless revenue opportunity. The report posits that 5G will "shake up the media and entertainment landscape. It will be a major competitive asset if companies adapt."

But, it warns, companies that don't adapt "risk failure or even extinction."

While South Korea is shooting to roll out 5G there by 2019, the target for the rest of the world is mid-2020, when chipsets will be widely available in phones and operators are expected to have most technology — and standards — in place.

Just two years after 5G's expected general roll out, the report forecasts about 20% of global wireless media revenues — $47 billion of a $253 billion market — will be generated by using the super-high-bandwidth capabilities of 5G. By 2025, those numbers are expected to grow to 57%, or $183 billion of the $321 billion market, and by 2028, 80%, or $335 billion of the $420 billion market.

The low latency of these networks means that video won't stall or stop, and that livestreaming and large downloads will happen in the blink of an eye.

Not surprisingly, the report posits that 5G will accelerate content consumption, including mobile media, mobile advertising, home broadband and TV.

The average monthly traffic per 5G subscriber will grow from 11.7GB in 2019 to 84.4GB per month in 2028, at which point video will account for 90 percent of all 5G traffic. In 2017, users in Finland used the most mobile data per month, about 15.5 gigabytes, according to a report from the Organization for Economic Co-Operation and Development.

That growing market will, of course, include plenty of sports as they become an even more crucial piece of the mobile inventory. More events, big and small, will make their way online. And a lot of it will be viewed on mobile devices.

In Q3, mobile starts — especially in North America — likely will see another boost. One big reason will be the NFL, which has seen its digital viewership increase 65% since the league decided to make all games available online, ending its exclusive Sunday mobile streaming deal with Verizon and extending more digital rights to CBS, ESPN, NBC Universal and Fox Sports through the NFL App, as well as via Verizon.

And, while Giants fans are celebrating the strong start of their 1st round draft choice, Saquon Barkley, the league has fallen in love with smartphones; mobile viewership is up a whopping 147% over 2017 through the first four games of the season.

"We want to make sure fans have access to as much of our content as possible, especially the live games." said Kevin LaForce, the NFL's senior vice president for media strategy and business development. "There is an expectation of fans getting their content where they want it, when they want it. We have to provide that for them."

Making more content available over the top, especially on mobile devices, is critical for the NFL, LaForce said.

About 30% of U.S. adults between 18 and 54 say they've streamed sports to their mobile phones or tablets, according to a **December 2017 Think with Google survey**. Football highlights searches almost doubled during the year, according to the study, and consumers spent 60% more time watching interviews of athletes on mobile devices.

"There are younger people who have grown up with digital devices," LaForce said. "They reach for digital first. This helps connect us with them."

Of course, there are stumbling blocks to widespread adoption of sports viewing on mobile devices, not the least of which is latency. But the pending arrival of next-gen 5G wireless networks — which promise massive bandwidth availability and dramatic decreases in latency — are at least part of the answer.

At IBC, for example, video was referred to by more than one speaker as the event as the "killer app" for 5G. The killer content for that killer app? Live sports.

It's not just sports that are having success going over the top to mobile devices. Research firm Sensor Tower **reported** that Netflix — in Q1, Q2 and Q3 of 2018 — had the top grossing non-gaming app worldwide. Q3 revenues were $243.7 million, up 90% Y/Y from Q3 2017 in the App Store and Google Play. Chinese streamers Tencent Video and iQIYI, as well as stalwart YouTube, also were in the Top 6.

THE BOTTOM LINE

With a relentlessly growing volume of content coming over the top, especially to mobile devices, content owners and distributors are going to have to also adapt to new ways of processing content, from its initial conception all the way through production and distribution. And, once it's delivered, maximizing ROI will, obviously, be key to maintaining the ability to feed what has become a consumer obsession with online video.

A flexible, extensible, content supply chain has increasingly become the focus of broadcasters and other content distributors looking to scale their content flow.

At the root of the content supply chain is the optimization of operations to increase speed and efficiencies with an eye toward ROI and the bottom line.

Content distributors of all kinds need to take a manufacturing mindset toward meeting increasing content demands. Just as a widget factory gears up its supply chain to feed its production line during times time of high demand for widgets, so, too, must broadcasters use automation, machine learning and artificial intelligence to maximize their own content supply chain.

Content owners and distributors need to take advantage of this unprecedented period of content demand to pivot into treating technology operations similar to manufacturing operations. The move to a content supply chain is a fundamental, data-driven change.

GLOBAL MOBILE CONSUMPTION TRENDS

SHARE OF PLAYS IN EMEA

EMEA saw mobile video plays hit 54%, up from 49% a year ago, an increase of more than 10% Y/Y and 26% over the past two years.

EMEA has seen fairly steady growth in mobile video plays, especially as more OTT services have launched in the past two years, including many platforms dedicated to sports content. Consumption of mobile video is growing at a rapid pace and will continue to benefit from the removal of geo-blocking.

While Internet penetration is high in the region at nearly 80%, smartphone penetration is several percentage points higher; only about 15% of the region's population is not connected via smartphones.

An increase in major wireless providers offering unlimited data plans also is contributing to an increase in mobile consumption of content. But, there's still plenty of room for growth in the region's mobile video plays. As more premium content is made available to mobile devices, more video will migrate to them.

Also adding to mobile's future growth: The very early start some areas in EMEA, specifically the Nordics, have in deployment plans for 5G. While the global goal is mid-2020, several carriers already are trialing the technology. But, not every country is as eager to launch as those in the Nordics. Overall, Europe appears behind the U.S. and much of Asia in plans to deploy 5G, with the middle of the decade a more likely place for broad deployment to begin.

According to tech researcher CCS Insight, there are expected to be more than 1.3 billion subscribers to 5G globally by 2023, only 9% of them in Europe. South Korea, China, Japan and the U.S. are seen as leaders in the space with multiple 5G trials in each country already underway.

SHARE OF PLAYS IN ASIA-PAC

Asia-Pac hit a whopping 74% of plays on mobile devices, up from 61% a year ago. That's a 21% increase Y/Y and a 64% rise over the past two years.

Much of that growth can be attributed to more content coming into the OTT space in the past 18 months, especially sports in Australia, a huge catalyst for mobile video consumption.

Asia-Pac has seen mobile plays above 50% since Q3 2016, tied for the longest run above 50% with North America.

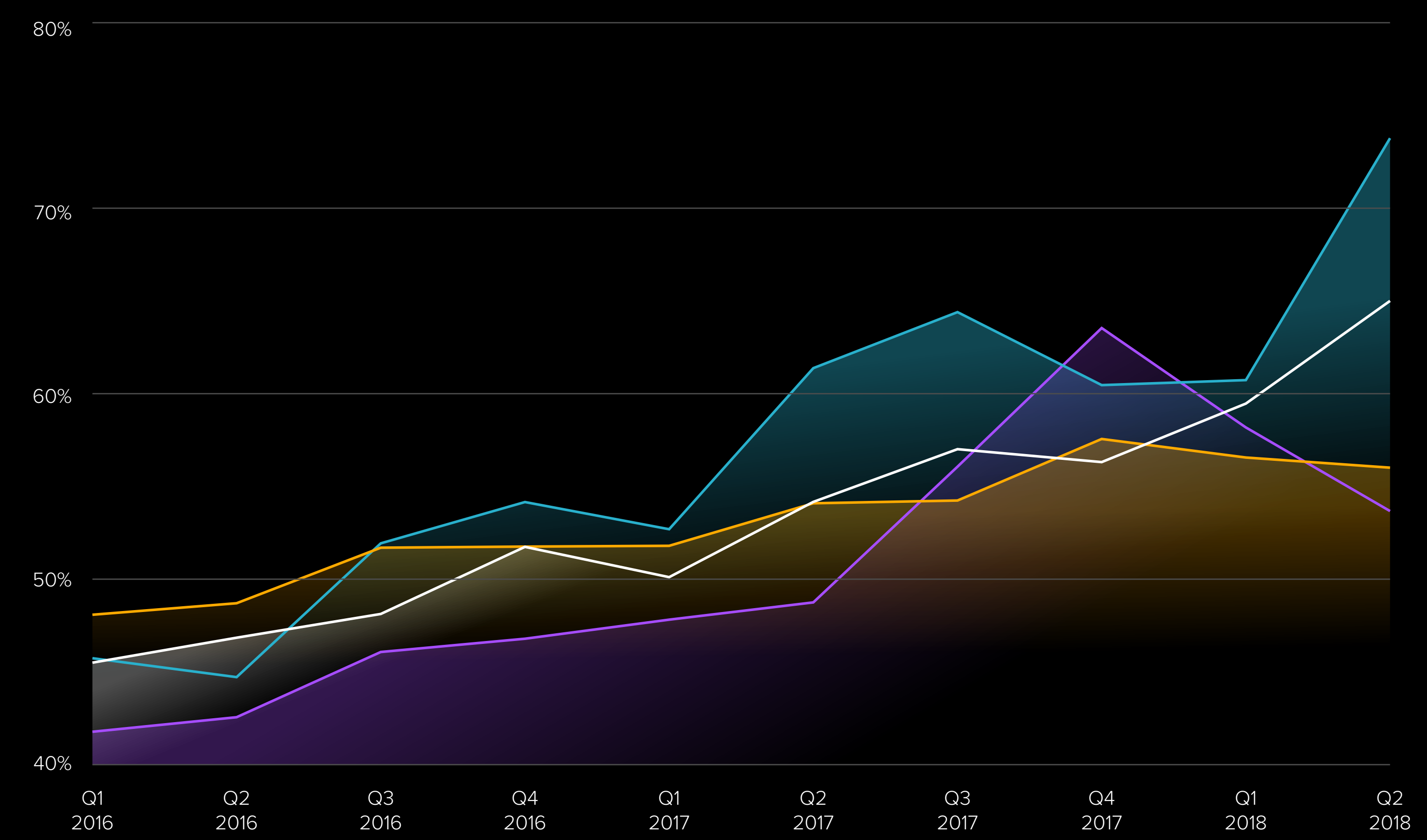
The Asia-Pacific region is a competitive one in terms of OTT, with multiple telcos investing heavily in content and virtual bundles of content targeted specifically for consumption on mobile devices.

As mentioned earlier, apps for Chinese platforms Tencent and iQIY are two of the most heavily downloaded non-game apps in the world, and a score of regional players also have seen success, specifically in the mobile arena. PCCW, for example, launched early — and often — in the region, delivering a hybrid of free, ad-supported and subscription-based video. iFlix is a solid competitor to Netflix, although it's significantly smaller. It delivers a large amount of local content, a key to the market in Asia-Pac.

As eMarketer notes, Asia-Pac is "home to one of the most competitive OTT markets in the world." Subscriber growth there is expected to be faster than any other region, exceeding 35% in 2018.

The region also has roughly half of all 5G trials taking place, a testament to the region's commitment to mobile growth. By 2025, as many as 60% of all 5G connections — excluding IoT — or about 670 million subscribers could call Asia home, industry group the GSM Alliance says.

With that commitment to 5G and a rapidly expanding OTT ecosystem will come continued growth in mobile video plays.



GLOBAL MOBILE VIDEO STARTS
Q2 2018

OOYALA

EMEA
ASIA PACIFIC
NORTH AMERICA
LATAM

GLOBAL MOBILE CONSUMPTION TRENDS

SHARE OF PLAYS IN NORTH AMERICA

North America's share of mobile plays hit 56% in Q2, up slightly from 54% a year ago (about 4% Y/Y) and up 14% since Q2 2016. It was the 8th consecutive quarter mobile plays have seen a share above 50% in the region.

A quick look at the region's pace of mobile video growth might indicate that it was plateauing, but the reality is that it's seen slow, steady growth over the past 10 quarters. The region will continue to see slightly more accelerated growth through the end of the decade, at which time 5G will propel it into a rapid-growth phase for years.

The 5G market in North America is expected to see a CAGR of 77% through 2025. The United States already has more than a handful of 5G trials from Verizon and AT&T launched around the country and is expected to be one of the first countries to launch commercial service. By the middle of the decade, according to a report from Research and Markets, about 84% of the North American population — more than 300 million people — are expected to be mobile 5G subscribers and many of them will use their devices to consume video.

In the U.S., the number of OTT services has increased to more than 220, more than twice the number available in 2014. That availability of content through multiple services has prompted more than 60% of U.S. broadband households to subscribe to at least one SVOD service. The most rapidly growing segment? Households with four or more services.

Overall, North America also is seeing strong growth in the number of SVOD consumers, with forecasts saying that the number of subscribers to OTT services will top 208 million in the U.S. alone by 2023, with 74% of all TV households subscribing to at least one service, up from 55% of HH in 2017.

Digital video ad spending in the U.S. is expected to grow at double-digit rates through 2022, according to eMarketer, as brands search for ways to connect with consumers, especially Millennials. The company said it expects that by early next decade, more viewers will watch OTT video than traditional TV. Parks Associates, meanwhile, points out that the number of hours of video being viewed on mobile phones increased 55% between 2015 and 2017, a shift that has occurred as fewer hours of live broadcast video are consumed.

SHARE OF PLAYS IN LATIN AMERICA

Latin America saw its highest quarterly share of mobile video starts in the second quarter, as 65% of plays began on mobile devices. That's up from 54% a year ago and 47% two years ago, increases of 20% and 38% respectively.

Q2 was the first time the LatAm region had topped 60%. But, the region flirted with 60% in Q1, recording 59.45% of all video starts on mobile devices. The two quarters are good indicators of where LatAm should head for the remainder of the year, especially as more affordable Android smartphones saturate the market.

Q2 marks the seventh consecutive quarter where video starts on mobile devices exceeded 50% of all video starts. Since Q1 2016, only Asia-Pacific's mobile plays have averaged higher than LatAm's, no surprise as both markets exhibit similar trends:

- A rapidly expanding number of OTT services heavily influenced by local content;
- The mass-market surge of smartphone adoption (now about 60% of the 690 million connections in the region) has made the region the fastest-growing smartphone market in the world;
- An increase in 4G networks — which now cover 70% of the population, according to the GSMA; and,
- A long-term commitment to 5G deployment, expected to reach about half the population by 2025.

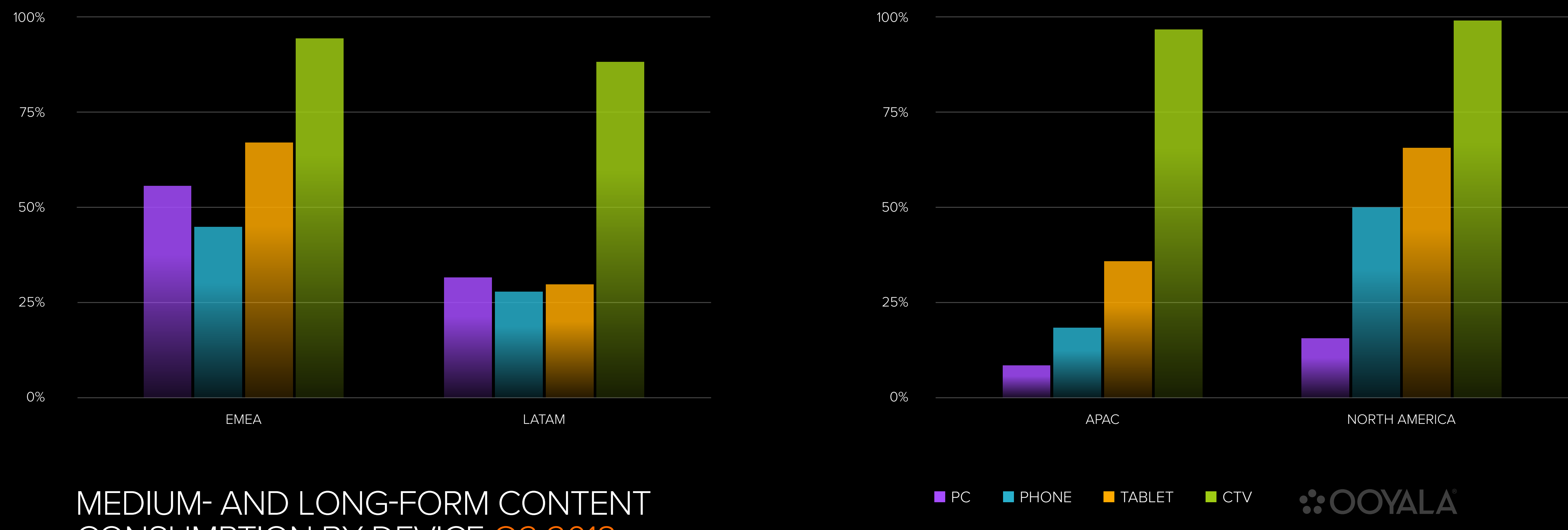
LatAm mobile users are more likely to access the Internet via their phones than are mobile users in the United States. About three-quarters of LatAm mobile subscribers, some 350 million users, use mobile Internet regularly.

THE BOTTOM LINE

While some markets are seeing surges in the share of video plays on mobile device — notably Asia-Pacific and LatAm — the reality is that all regions continue to see strong growth. Growing access to premium content online, especially live streamed sports, will continue to lure more users to watch on mobile devices.

While much has changed in the OTT industry over the past several years, several things have remained constant, specifically that users want to watch all of their content when they want to, where they want to and on the device they choose.

Continued growth of bandwidth, reduced prices on data plans, an increase — or elimination — of data caps and the eventual arrival of 5G networks will make the ability to deliver a "TV-like" experience to mobile devices all that much more important.



MEDIUM- AND LONG-FORM CONTENT CONSUMPTION BY DEVICE Q2 2018

ENGAGEMENT TRENDS

A combination of medium-form (5–20 mins.) and long-form content (over 20 mins.) continued to push time watched past 50% on nearly every screen in all regions but Latin America, where time watched on smartphones, tablets and computers was between 28% (smartphones) and 32% (computers). Only connected TVs saw time watched for the combo top 50%, and the 88% it recorded for CTVs was lower than the rest of the world's 98% average.

LatAm also was anomalous in the quarter in terms of short-form (0–5 mins.) video time watched. It was the only region where short-form content absolutely dominated PCs, tablets and smartphones. Short-form time watched on PCs was 68%, on smartphones 72% and on tablets 70%. Last quarter, the region saw long-form time watched dominate CTVs (96%), tablets (77%), PCs (74%), and smartphones (49%).

On its own, long-form content dominated screens in more mature markets like North America and EMEA.

In EMEA, long-form time watched was highest on CTVs (89%), tablets (57%), PCs (37%) and smartphones (33%). In North America, long-form time watched topped 99% for CTVs, followed by tablets (82%), smartphones (75%) and PCs (55%).

APAC saw long form time watched strongest on connected TVs (99%), followed by tablets (42%), PCs (36%) and smartphones (33%).

Combining medium- and long-form content produced results that were more in line with recent historical norms.

In EMEA, for example, the combination produced time watched on connected TVs of 95%, with strong results for tablets (67%), PCs (56%) and smartphones (45%).

In APAC, the combination produced time watched on connected TVs of 99%, followed by tablets (74%), smartphones (68%) and PCs (64%).

In North America, the combination produced time watched on connected TVs of 99%, followed by tablets (86%), smartphones (80%) and PCs (66%).

In LatAm, the combination produced time watched on connected TVs of 88%, followed by PCs (32%), tablets (30%) and smartphones (28%).

THE BOTTOM LINE

For several quarters we've often seen time watched for long-form content flirt with, and exceed, 50% on all screens, especially CTVs and tablets. PCs and smartphones have occasionally joined that duo, but both often seem more suited to "grazing" shorter content. For PCs it's often long sessions of user-generated content, while smartphones often are leveraged to catch up with the news and sports, where highlights rule.

But, moving forward, especially as the digital natives of Gen Edge follow Millennials to the table, expect more and more often that any content will be viewed on any device. And, as 5G takes root across the globe, you'll need to make sure that your service is optimized for a mobile experience. If not, consumers will simply move on to a service that is.

ABOUT OOYALA'S GLOBAL VIDEO INDEX

This report reflects the anonymized online video metrics of the vast majority of Ooyala's 500+ customers, whose collective audience of hundreds of millions of viewers spans nearly every country in the world. This report does not document the online video consumption patterns of the Internet as a whole. But the size of the Ooyala video footprint, along with the variety of our customers, results in a representative view of global consumption and engagement trends.

For over 10 years, Ooyala has been at the forefront of shaping the content supply chain revolution as a leading provider of OTT, content production, and digital distribution solutions. Ooyala powers linear and on-demand video for the world's largest companies, managing thousands of hours of content and serving billions of streams across all platforms.

With its open APIs and vast partner ecosystem, Ooyala Flex Media Platform provides a single source of truth for managing metadata and workflows of media companies. The Ooyala Flex Media Platform enables content creators and distributors to become more agile and cost efficient by automating tasks, simplifying workflows and reducing time-to-TV-grade experiences across all screens.

Ooyala has offices in the Silicon Valley, Chennai, Dallas, Guadalajara, London, Madrid, New York, Paris, Singapore, Sydney, Tokyo, and sales operations in many other countries across the globe. For more information, visit **www.ooyala.com**.