

VIDEO INDEX

REPORT

Q4 2011

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EXECUTIVE SUMMARY

Ooyala's advanced technologies give video publishers the power to deliver engaging viewing experiences on all devices and screens. Our Big Data architecture and industry-leading analytics provide key insights into how people watch video everywhere.

Ooyala's data set is truly global. Nearly half of all our video plays occur outside the United States. We handle more than 1 billion analytics pings per day and measure the anonymized viewing habits of more than 100 million unique users every month. Ooyala applies these insights to help publishers grow their audiences and earn more revenue with online video.

This report builds on findings from [our analysis of Q3 2011](#). Our key Q4 findings include:

- Video plays on tablets, mobile devices and connected TVs **nearly doubled in the fourth quarter**. Expect this trend to continue throughout 2012 and beyond.
- **Big screens are for big content**. Videos longer than 10 minutes accounted for more than half the hours played on connected TV devices & gaming consoles (CTV&GC).
- Both **iPhone and Android grew rapidly** in terms of mobile video plays and hours watched. The mid-October release of the iPhone 4S fueled iOS growth.
- **Facebook continues to beat Twitter in video sharing**. According to Ooyala data, for every video shared via Twitter in Q4, more than 10 were shared on Facebook.
- Compared to desktop viewers, people who watched on connected TV devices and gaming consoles were 70% more likely to watch three-quarters of a video—a good gauge of viewer engagement.
- As we previously reported, tablet viewers were the most engaged in Q3. In Q4, they remained a remarkably attentive audience: they were 45% more likely to complete three-quarters of a video than viewers who watched on a desktop.
- **I want my GTV**. Google TV showed impressive growth throughout the fourth quarter. Total video plays grew by 91%.
- **Home for the holidays**. Video plays on tablets and mobile devices were up in a big way at the end of December. While it was part of a larger trend of rapid device growth, this increase in mobile video viewing was likely an effect of the end-of-year festivities. The one-two punch of newly-gifted gadgets and time spent away from the office likely resulted in more online videos played on more devices.

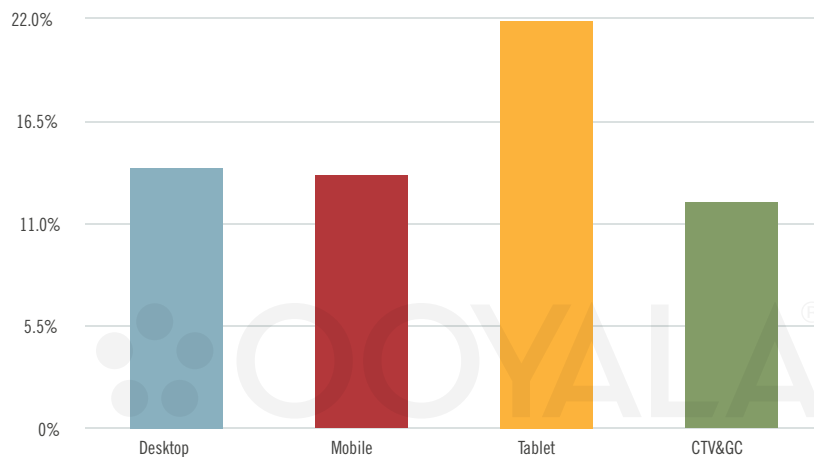
Questions or comments? Email videoindex@ooyala.com.

VIEWER BEHAVIOR & ENGAGEMENT

Ooyala's video analytics technology measures viewer engagement in real time. We analyze conversion rates (the ratio of video displays to video plays), video completion rates, social sharing events and a bevy of other key metrics and variables. When combined with data delineating device type and geography, these metrics increase our understanding of viewer behavior.

Our data suggests that viewers are watching more videos online—they're clicking "play" at a higher rate and watching longer per video play. The average conversion rate across all devices, for instance, increased from 35.1% in Q3 to 39.6% in Q4. Moreover, viewers in Q4 watched longer on all devices, as shown in this chart.

QOQ GROWTH IN TIME WATCHED PER PLAY, Q4 2011



❖ KEY INSIGHTS

Q4 viewers were more than twice as likely to complete a video when watching on a connected TV device than when watching on a desktop.

People are watching longer on their tablets: they watched 21.9% longer per video in Q4 than in Q3.

Q4 data suggests that copying and pasting a video URL is a more common way of sharing than Tweeting.

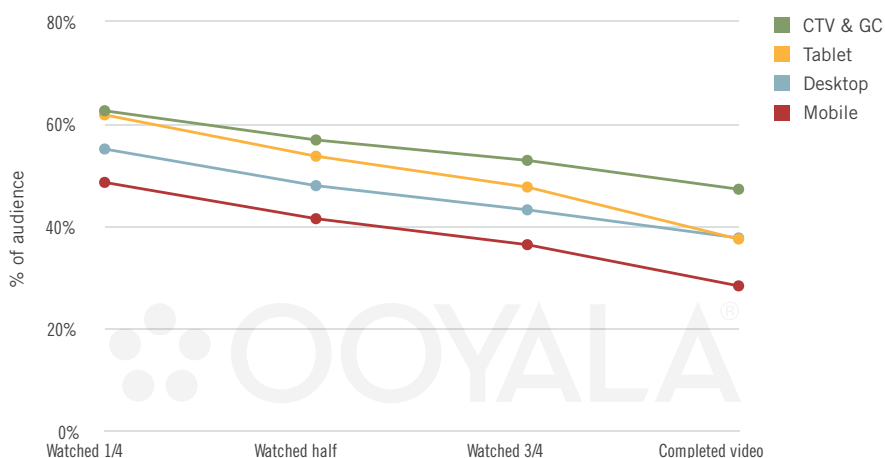
ENGAGEMENT

Device type heavily influences viewer engagement. Viewers watching on connected TV devices and game consoles (CTV&GC) in Q4 were the most engaged of all, completing videos at a rate of 47%. Tablet viewers, who completed videos 38% of the time, were a close second. In Q3, desktops had the lowest engagement rates of all device types, but in Q4 viewers were least engaged when watching on mobile devices.

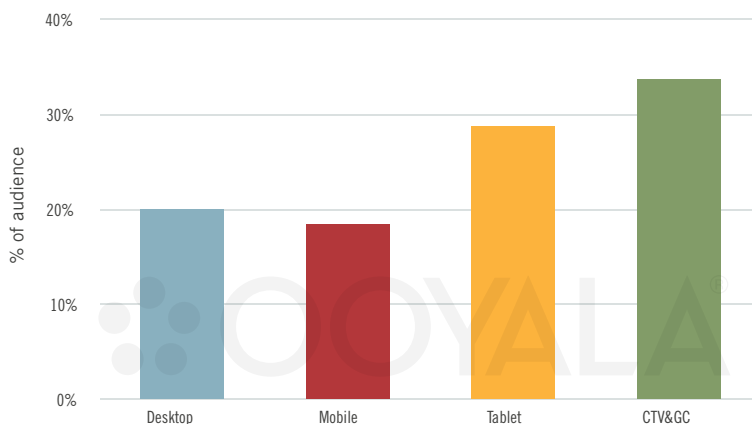
THE BOTTOM LINE:

Viewers watch differently on different devices. Video publishers need to measure and understand these differences in order to create viewing experiences that engage viewers effectively.

VIEWER ENGAGEMENT BY DEVICE, Q4 2011



VIEWERS WHO COMPLETED 3/4 OF VIDEO LONGER THAN 10 MINUTES IN LENGTH, Q4 2011

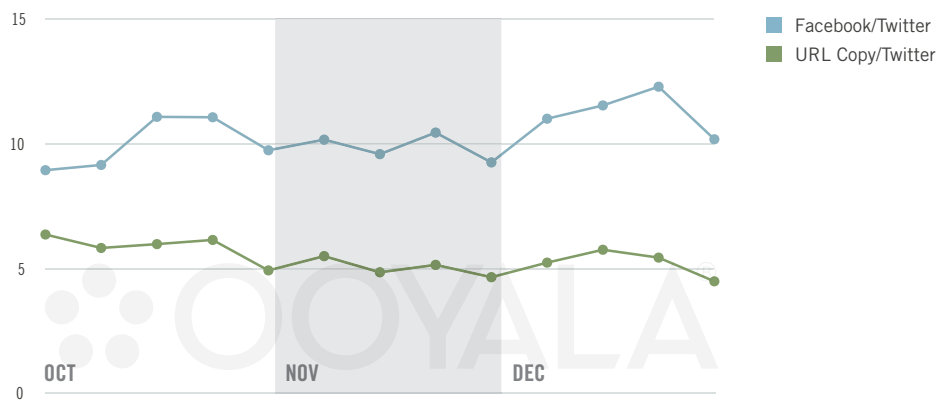


SOCIAL MEDIA

As in Q3, data from Q4 indicates that the world's biggest social network is winning the battle for viewers' attention. For every one video shared via Twitter during the quarter, more than 10 videos were shared on Facebook.

Not only that, Twitter was outpaced by a more traditional means of sharing: In Q4, users shared more videos by copying and pasting a URL than by tweeting.

VIDEO SHARING VIA SOCIAL MEDIA, Q4 2011

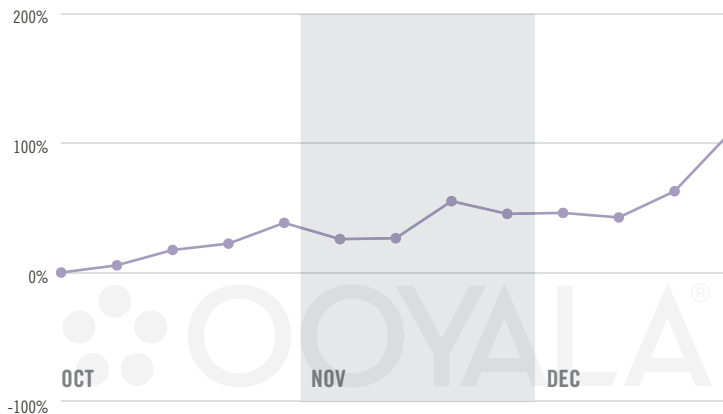


THE BOTTOM LINE: Some social networks are more conducive to video sharing than others. To implement a successful social video or social TV strategy, publishers need: **1:** tools to target the social networks most relevant to their audience, and **2:** analytics to measure and track content sharing trends.

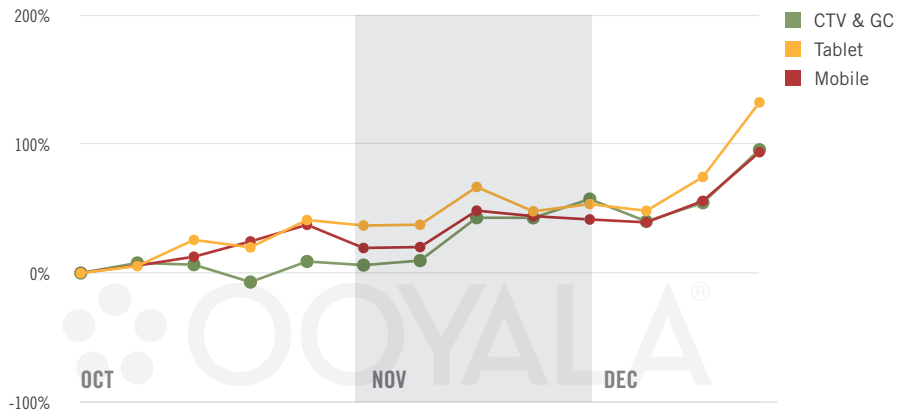
SCREENS, DEVICES & PLATFORMS

The headline story in Q4, and for much of 2011, was the phenomenal growth of video played on non-desktop devices, such as tablets, smartphones, gaming consoles and connected TV devices. The share of non-desktop video plays more than doubled in Q4.

QOQ GROWTH IN TIME WATCHED PER PLAY, Q4 2011



GROWTH IN SHARE OF PLAYS BY DEVICE, Q4 2011



❖ KEY INSIGHTS

In Q4, viewers watched more videos on mobile devices, but on average stayed engaged longer when viewing on tablets.

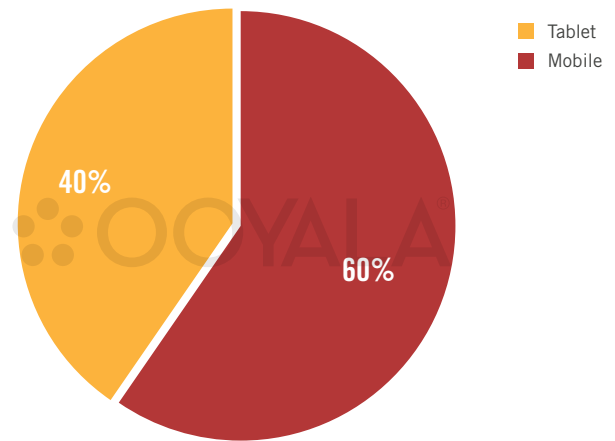
People watched four times as many long videos as short videos when watching on connected TV devices and gaming consoles.

Google TV notched impressive growth in Q4: Its share of video plays increased by an impressive 91% during the quarter.

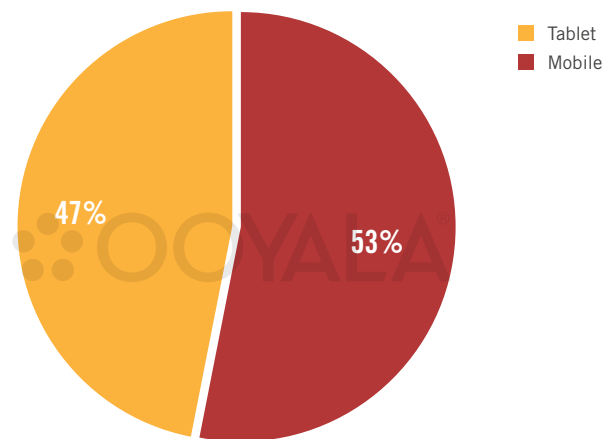
TABLETS & MOBILE DEVICES

Device type heavily influences viewer engagement. Viewers watching on connected TV devices and game consoles (CTV&GC) in Q4 were the most engaged of all, completing videos at a rate of 47%. Tablet viewers, who completed videos 38% of the time, were a close second. In Q3, desktops had the lowest engagement rates of all device types, but in Q4 viewers were least engaged when watching on mobile devices.

TOTAL VIDEO PLAYS, Q4 2011



TOTAL HOURS WATCHED, Q4 2011



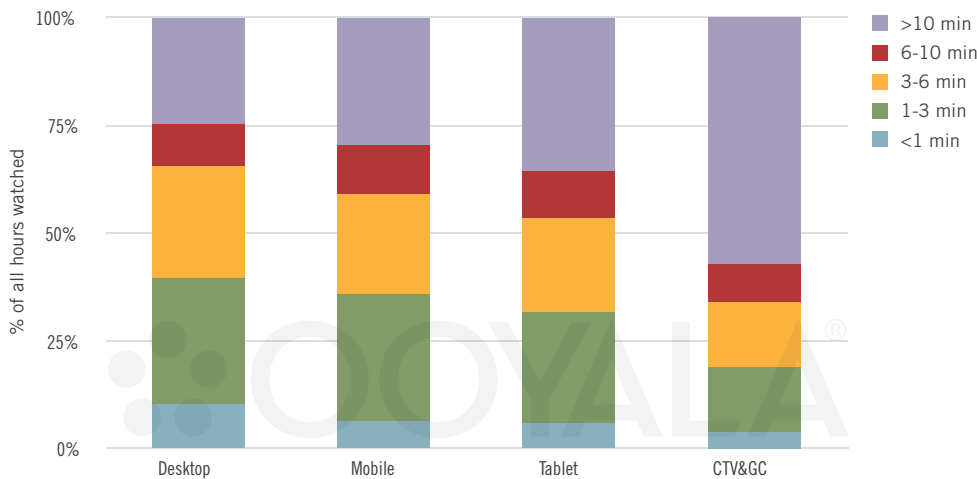
CONNECTED TV DEVICES & GAMING CONSOLES (CTV&GC)

Recent data confirms what we published in Q3 of 2011: People watch more long-form content on their big screens than on any other device. The connected couch potato is logging on and “leaning back” with his or her favorite movies and TV shows.

A couple of noteworthy findings:

- Long-form videos accounted for 57% of the hours watched on a connected TV device or game console; short videos accounted for 19%.¹
- Viewers using a connected TV device or gaming system watched 288% longer per play on average than desktop viewers.

TIME WATCHED BY VIDEO LENGTH & DEVICE, Q4 2011



THE BOTTOM LINE: Compared to desktops and laptops, which have keyboards and let users open multiple windows, tablets and connected TVs have few distractions. And compared to mobile devices, they offer larger screens. These factors may help explain why tablets and connected TV devices have high viewer engagement rates.

Online video isn't “early adopter” territory anymore. It's clear that more and more people are firing up Netflix, Roku, Boxee or Xbox to watch long-form content on the big screen. They're also watching more long-form videos on their iPads, Kindle Fires and Android tablets.

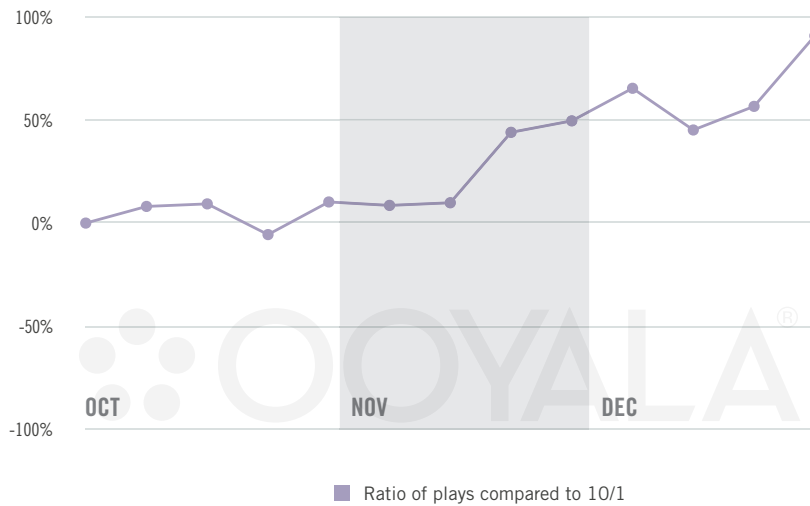
Our research confirms that people use different devices in different ways. Context matters for viewers, video publishers and advertisers. While shorter clips dominate smaller screens and desktops, the larger viewing area (and fewer distractions) of tablets and connected TV devices encourage viewers to watch longer.

¹ Long videos are defined as those that are longer than 10 minutes in length; short videos are three minutes or shorter.

VIDEO TRENDS: GOOGLE TV

While still small when compared to all online video watched in Q4, Google TV's share of video plays increased by an impressive 91% during the quarter. After a series of false starts, Google TV may finally be gaining broader traction with consumers.

GOOGLE TV: GROWTH IN SHARE OF VIDEO PLAYS, Q4 2011



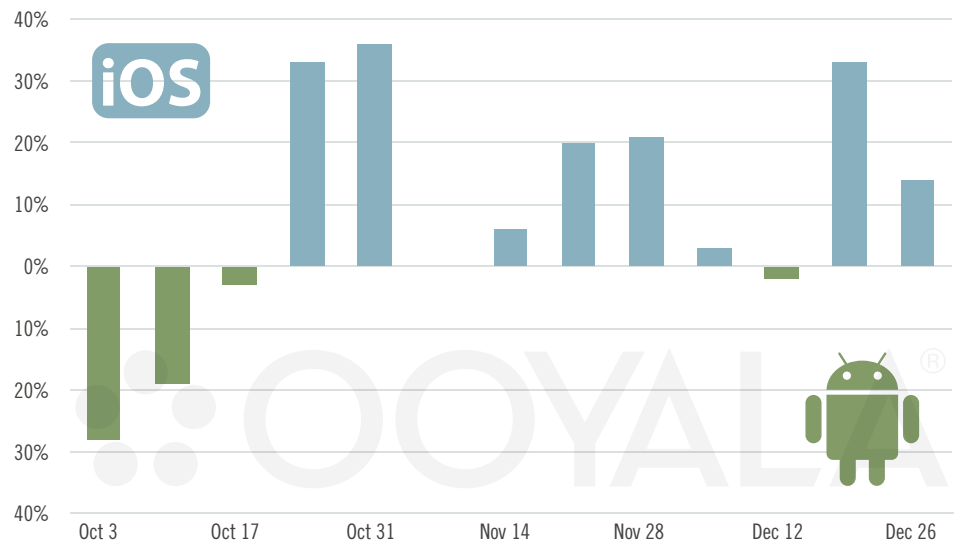
IOS VS. ANDROID

Both iOS and Android are growing rapidly in terms of mobile video consumption. Growth in the iPhone's share of total video plays outpaced that of Android for much of the quarter, a trend that is partly explained by the release of the iPhone 4S on October 14. Note the uptick in iPhone's share in subsequent weeks.

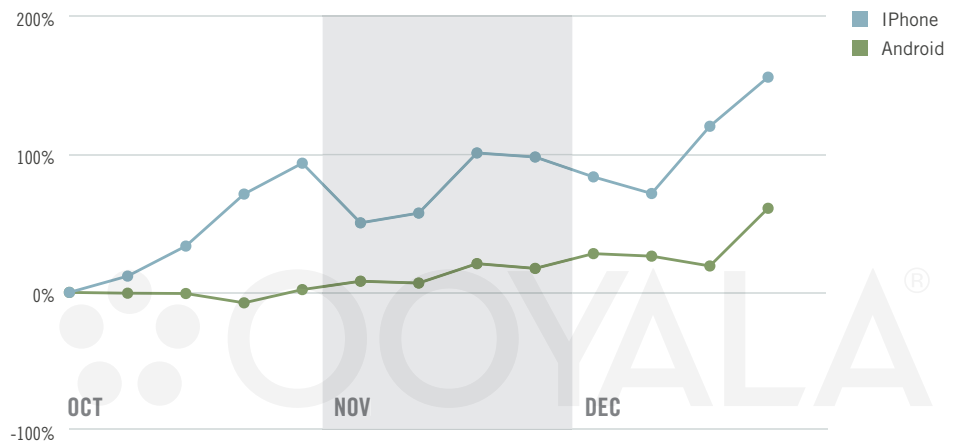
THE BOTTOM LINE:

Video consumption on iOS and Android mobile devices is exploding. Publishers must deliver high-quality viewing experiences to both platforms.

IOS VS. ANDROID RELATIVE SHARE OF PLAYS, Q4 2011



IOS VS. ANDROID GROWTH SHARE OF PLAYS, Q4 2011

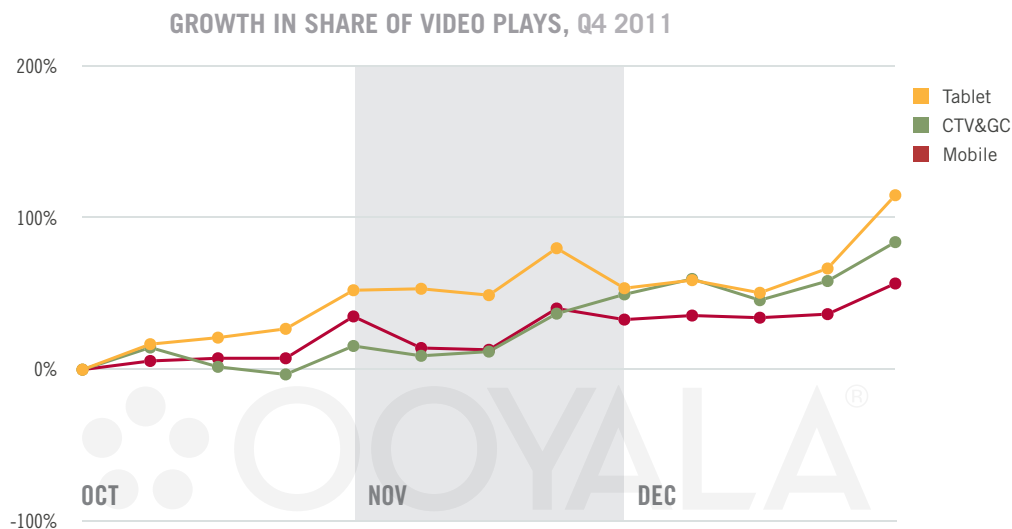


THE BIG NUMBER: IP TELEVISION

224%. 336%. 460%.

That's annualized growth projections in the share of video plays on mobile devices, connected TVs and gaming consoles, and tablets—if their growth rate in Q4 continues.

Note that these estimates pertain to publishers in Ooyala's TV industry segment, which includes broadcasters, networks and studios. All our analyses of this segment indicate strong growth trends. As more broadcast-quality and original TV content becomes available online, expect an increasing number of viewers to watch their favorite shows on tablets, smartphones, Roku and Xboxes.



GLOBAL AUDIENCES

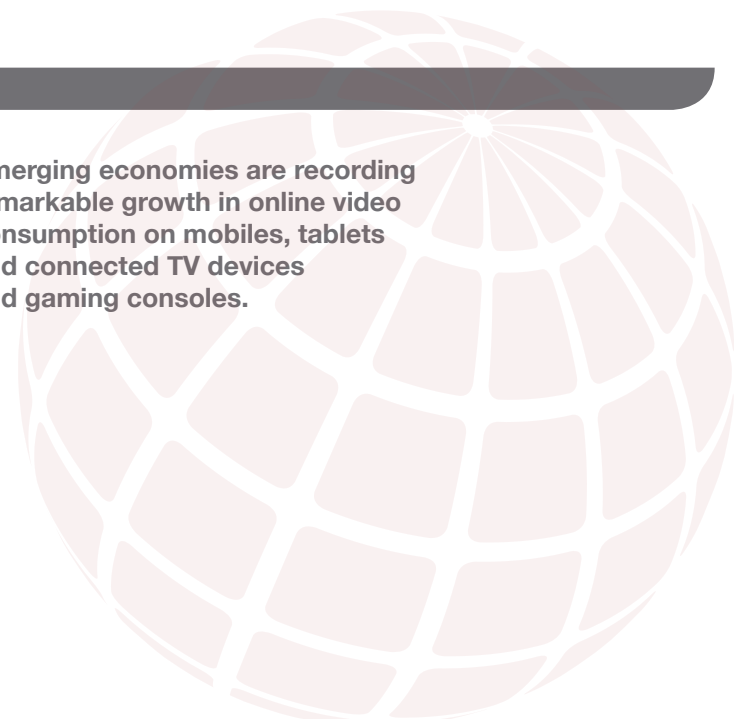
Ooyala's data set covers video plays across more than 5,000 domains in more than 130 countries. On a monthly basis, more than 100 million viewers watch video on an Ooyala-powered site.

The growth in online video exhibited during Q4 is reflective of a global trend: Viewers are buying more devices, everywhere, and watching more online video than ever before. Various analysts project that worldwide by 2015 there will be 500 million connected TVs,² 1 billion smartphones³ and 325 million tablets.⁴ These new screens make up a global audience of 1.2 billion viewers.⁵

❖ KEY INSIGHTS

Connection speeds, as measured by Ooyala's video technology, vary by region, with relatively high bit rates in much of North America, Europe and parts of Asia, such as South Korea.

Emerging economies are recording remarkable growth in online video consumption on mobiles, tablets and connected TV devices and gaming consoles.



² "Connected TV Shipments to Exceed 138 Million Units in 2015, Putting Total Worldwide at 500 Million," [via Display Research](#), July 5, 2011.

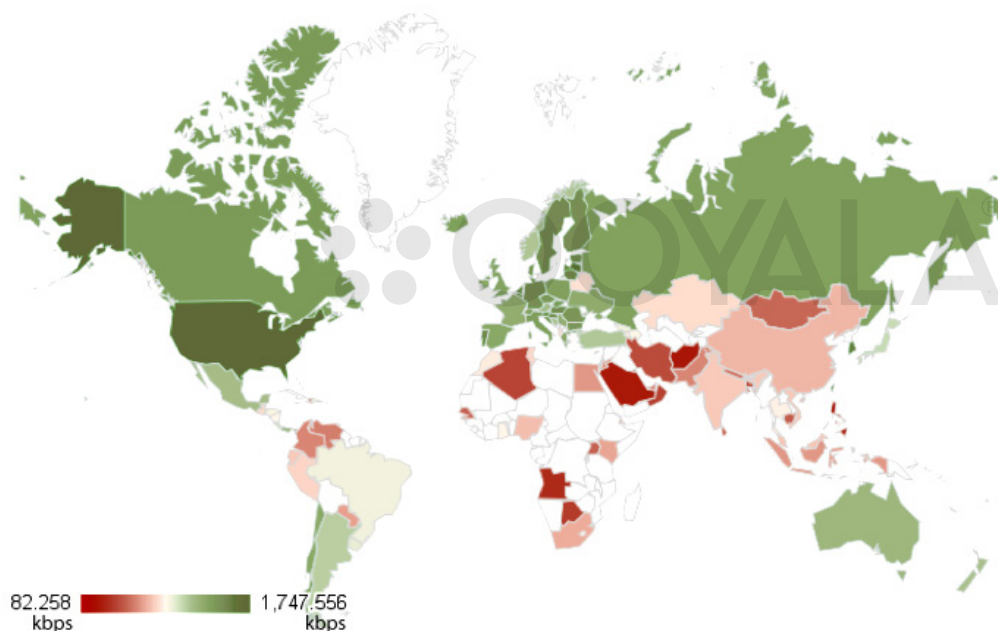
³ "Worldwide Smartphone Market Expected to Grow 55% in 2011 and Approach Shipments of One Billion in 2015," [via IDC](#), June 9, 2011.

⁴ "Gartner Says Apple Will Have a Free Run in Tablet Market Holiday Season as Competitors Continue to Lag," [via Gartner](#), September 11, 2011.

⁵ "More than 200 Billion Online Videos Viewed Globally in October," [via comScore](#), October 2011.

BIT RATE & CONNECTION SPEED

When Ooyala's video player loads, it gauges a number of variables, including CPU status, network connection speed and available encodings. Accordingly, Ooyala's technology delivers the appropriate video encoding to ensure optimal playback.⁶ The resulting data paints an interesting picture of prevailing network speeds throughout the world, as shown in the map below.



AVG. BITRATE FOR DESKTOP PLAYS, Q4 2011

Desktop bit rate (kbps):		Mobile bit rate (kbps):		Tablet bit rate (kbps):		CTV&GC bit rate (kbps):	
1. United States	1,748	1. Greece	1,617	1. Ukraine	1,789	1. Italy	2,000
2. Taiwan	1,610	2. Germany	1,361	2. Sweden	1,496	2. New Zealand	1,947
3. Rep. of Korea	1,574	3. Russia	1,289	3. Netherlands	1,408	3. Japan	1,885
4. Sweden	1,506	4. Austria	1,237	4. Israel	1,405	4. Ireland	1,855
5. Germany	1,486	5. Sweden	1,232	5. Russia	1,271	5. Taiwan	1,792
6. Netherlands	1,484	6. Belgium	1,224	6. Argentina	1,187	6. United Kingdom	1,660
7. Belgium	1,465	7. Norway	1,219	7. United Kingdom	1,187	7. Israel	1,616
8. Canada	1,395	8. Italy	1,162	8. Switzerland	1,143	8. Canada	1,587
9. Italy	1,380	9. Ukraine	1,134	9. United States	1,005	9. Brazil	1,555
10. Switzerland	1,365	10. France	1,083	10. Greece	993	10. United States	1,502

⁶ The bit-rate numbers included in this report reflect more variables than available bandwidth. Ooyala's technology gauges CPU status, screen size, and network capacity and availability before selecting the appropriate video encoding to minimize buffering and ensure high-quality playback. Because more variables are included, Ooyala's measure of average bit rate is likely to diverge somewhat from industry estimates for average bandwidth rates by country.

EMERGING MEDIA MARKETS

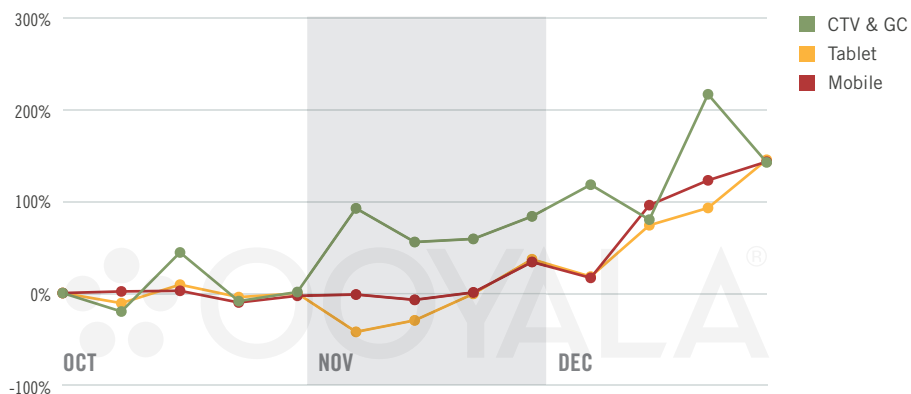
Growth in online video plays and time watched wasn't limited to developed markets like the U.S. and Europe. High-growth economies like Brazil, China, Russia and India also grew strongly throughout the quarter.

Connected TV devices and gaming consoles led in terms of total video plays and time watched during much of the quarter, though mobile devices and tablets also notched explosive growth. Each device's share of total online video plays more than doubled in a single quarter, reflecting robust annualized growth rates of around 1,000%.⁷

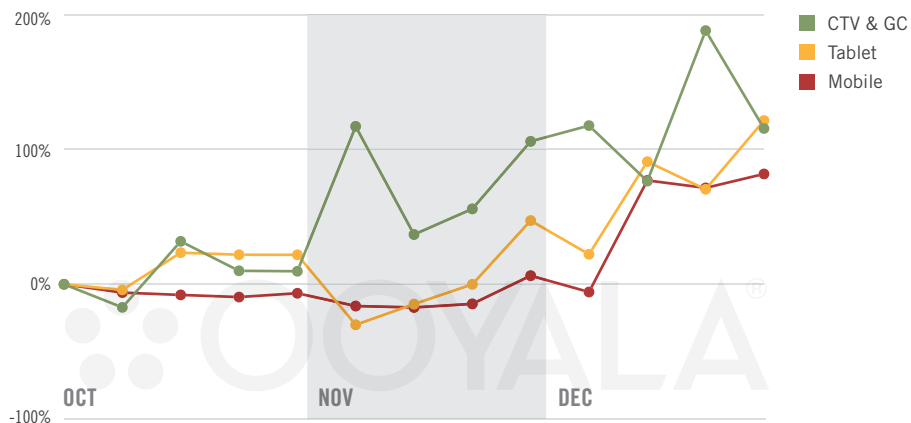
THE BOTTOM LINE:

While slow connection speeds may pose constraints to growth in some emerging markets, viewers' appetite for new devices and online video is creating record growth the world over.

EMERGING MARKETS: GROWTH IN SHARE OF PLAYS, Q4 2011



EMERGING MARKETS: GROWTH IN SHARE OF TIME WATCHED, Q4 2011



⁷ It's important to note that the December vacation effect may be skewing these growth numbers. Stay tuned for the Q1 Video Index to see if this growth is part of larger trend.

APPENDIX

DATA TABLES

GLOBAL CONVERSION RATE (PLAYS/DISPLAYS)

Week of	Conversion Rate Desktop	Mobile Conversion Rate	Tablet Conversion Rate	CTV&GC Conversion Rate
Oct 3, 2011	39.89%	41.11%	16.89%	40.41%
Oct 10, 2011	40.08%	42.14%	17.30%	47.19%
Oct 17, 2011	41.53%	41.94%	17.66%	56.30%
Oct 24, 2011	42.05%	43.42%	17.88%	54.42%
Oct 31, 2011	36.58%	41.98%	18.33%	36.23%
Nov 7, 2011	36.80%	42.59%	18.43%	52.05%
Nov 14, 2011	40.72%	43.01%	18.37%	59.30%
Nov 21, 2011	36.19%	41.22%	17.64%	49.55%
Nov 28, 2011	39.33%	42.94%	18.13%	57.91%
Dec 5, 2011	40.97%	44.35%	19.72%	56.42%
Dec 12, 2011	41.07%	44.53%	19.28%	47.75%
Dec 19, 2011	42.86%	41.92%	18.82%	54.16%
Dec 26, 2011	43.89%	41.97%	19.48%	53.33%

VIEWER ENGAGEMENT, BY DEVICE

	Desktop	Mobile	Tablet	CTV&GC
Watched 1/4	55%	49%	62%	63%
Watched half	48%	42%	54%	57%
Watched 3/4	43%	37%	48%	53%
Completed Video	38%	28%	38%	47%

GROWTH IN SHARE OF NON-DESKTOP VIDEO PLAYS

Week of	Growth in Tablet Share	Growth in Mobile Share	Growth in CTVGC Share	Ratio of Tablet/Mobile (Video Plays)	Ratio of Tablet/Mobile (Time Watched)
Oct 3, 2011	1.00	1.00	1.00	0.63	0.84
Oct 10, 2011	1.05	1.06	1.08	0.62	0.85
Oct 17, 2011	1.26	1.13	1.06	0.70	0.92
Oct 24, 2011	1.20	1.24	0.93	0.60	0.84
Oct 31, 2011	1.41	1.37	1.09	0.64	0.85
Nov 7, 2011	1.37	1.19	1.06	0.72	0.92
Nov 14, 2011	1.37	1.20	1.10	0.72	0.90
Nov 21, 2011	1.67	1.48	1.43	0.70	0.93
Nov 28, 2011	1.48	1.44	1.43	0.64	0.81
Dec 5, 2011	1.53	1.42	1.57	0.68	0.88
Dec 12, 2011	1.48	1.39	1.40	0.67	0.81
Dec 19, 2011	1.75	1.56	1.54	0.70	0.90
Dec 26, 2011	2.32	1.94	1.96	0.75	0.97

VIEWERS WHO WATCHED 3/4 OF A VIDEO

Device	% watched 3/4 of 10 min + video
Desktop	20%
Mobile	18%
Tablet	29%
CTV&GC	34%

TOTAL TIME WATCHED, BY VIDEO LENGTH & DEVICE

	Desktop	Mobile	Tablet	CTV&GC
<1 min	10%	6%	6%	4%
1-3 min	29%	30%	26%	15%
3-6 min	26%	23%	22%	15%
6-10 min	10%	12%	11%	9%
>10 min	25%	29%	36%	57%

ANDROID VS. IOS

Week of	iPhone Plays/ Android Mobile Plays	Time Watched iPhone/ Android Mobile	iPhone Growth in Share of Total Plays	Android Growth in Share of Total Plays
Oct 3, 2011	0.72	0.79	1.00	1.00
Oct 10, 2011	0.81	0.83	1.12	0.99
Oct 17, 2011	0.97	0.94	1.34	0.99
Oct 24, 2011	1.33	1.22	1.71	0.92
Oct 31, 2011	1.36	1.26	1.94	1.02
Nov 7, 2011	1.00	0.99	1.51	1.08
Nov 14, 2011	1.06	1.01	1.58	1.07
Nov 21, 2011	1.20	1.03	2.01	1.21
Nov 28, 2011	1.21	1.11	1.98	1.17
Dec 5, 2011	1.03	1.00	1.84	1.28
Dec 12, 2011	0.98	1.07	1.72	1.26
Dec 19, 2011	1.33	1.25	2.21	1.19
Dec 26, 2011	1.14	1.05	2.56	1.61

NETWORKS, BROADCASTERS & STUDIOS: GROWTH IN SHARE OF NON-DESKTOP PLAYS

Date	Mobile	Tablet	CTV&GC
Oct 3, 2011	1.00	1.00	1.00
Oct 10, 2011	1.06	1.17	1.15
Oct 17, 2011	1.08	1.21	1.02
Oct 24, 2011	1.08	1.27	0.97
Oct 31, 2011	1.35	1.52	1.16
Nov 7, 2011	1.14	1.53	1.09
Nov 14, 2011	1.13	1.49	1.12
Nov 21, 2011	1.40	1.80	1.37
Nov 28, 2011	1.33	1.54	1.50
Dec 5, 2011	1.36	1.59	1.60
Dec 12, 2011	1.34	1.51	1.46
Dec 19, 2011	1.37	1.67	1.58
Dec 26, 2011	1.57	2.15	1.84

GOOGLE TV

Week of	Ratio of plays compared to 10/3
Oct 3, 2011	1.00
Oct 10, 2011	1.08
Oct 17, 2011	1.09
Oct 24, 2011	0.94
Oct 31, 2011	1.10
Nov 7, 2011	1.09
Nov 14, 2011	1.10
Nov 21, 2011	1.44
Nov 28, 2011	1.50
Dec 5, 2011	1.65
Dec 12, 2011	1.45
Dec 19, 2011	1.57
Dec 26, 2011	1.91

EMERGING MARKETS: GROWTH IN TOTAL SHARE, BY DEVICE

Week of	Mobile Plays	Tablet Plays	CTV&GC Plays	Mobile Time Watched	Tablet Time Watched	CTV&GC Time Watched
Oct 3, 2011	1.00	1.00	1.00	1.00	1.00	1.00
Oct 10, 2011	1.02	0.89	0.80	0.94	0.96	0.83
Oct 17, 2011	1.02	1.09	1.44	0.92	1.23	1.32
Oct 24, 2011	0.90	0.96	0.91	0.91	1.22	1.10
Oct 31, 2011	0.97	1.00	1.01	0.93	1.22	1.10
Nov 7, 2011	0.98	0.58	1.92	0.84	0.70	2.17
Nov 14, 2011	0.93	0.70	1.56	0.83	0.85	1.37
Nov 21, 2011	1.01	0.99	1.59	0.85	1.00	1.56
Nov 28, 2011	1.34	1.37	1.84	1.06	1.47	2.06
Dec 5, 2011	1.17	1.18	2.18	0.94	1.22	2.18
Dec 12, 2011	1.96	1.74	1.80	1.77	1.91	1.76
Dec 19, 2011	2.23	1.93	3.17	1.71	1.70	2.88
Dec 26, 2011	2.43	2.45	2.42	1.82	2.21	2.16

METHODOLOGY

DATA SOURCES & SAMPLE SIZE

The data sample used in this report covers the fourth quarter of 2011, from October 1 through December 31. All data was taken from an anonymous cross-section of Ooyala's global customer and partner database—an array of broadcasters, studios, cable operators, print publications, online media companies and consumer brands. These firms broadcast video to over 100 different countries from more than 5,000 unique domains. More than 100 million unique viewers watch an Ooyala-powered video every month.

This data sample is not intended to represent the entire Internet or all online video viewers.

DATA COLLECTION

Ooyala's video analytics technology collects all anonymized video data in real time. During playback, Ooyala's video player continuously gathers information and relays it to an analytics module, which then stores the data in a distributed file system, Hadoop. Viewer statistics are then compiled and stored in a Cassandra data cluster, where the information is made readily available for analysis.

ANALYSIS & METRICS

- Ooyala's video analytics module tracks a range of standard variables, such as:
- Displays, plays and time watched
- Viewer engagement and video completion rates
- Sharing by social network
- Geography (region, state, city, Designated Marketing Areas)
- Device type (mobile, desktop, tablet, connected TV devices & game consoles)
- Operating system (Windows, Android, iOS)
- Browser (Safari, Chrome, Firefox, Internet Explorer)

For more details on specific metrics and measures, please see the Metrics & Definitions section in the appendix.

GLOSSARY

Conversion Rate: The ratio of plays to displays. 10 displays with 1 play is a conversion rate of 10%.

Completion Rate: The rate at which viewers watch a specified portion of a given video. Sometimes used interchangeably with “play-through rate.”

Display: Each (and any) time a video is loaded in a browser and displayed to the viewer

Mobile Devices: All smart phones, including iOS, Android, Blackberry and others.

Video Play: Each time a video starts playing.

Connected TV Devices & Gaming Consoles: Set-top-boxes and OTT devices, including Wii, Playstation, Boxee, Roku, Xbox and Google TV.

Tablets: All media tablets, including iOS and Android.

METRICS & DEFINITIONS

$v \Rightarrow$ an online video

$p \Rightarrow$ a publisher that owns many videos

$v \in p \Rightarrow$ a video owned by a publisher p

$S \Rightarrow$ is a set of publishers (e.g., the TV vertical)

$p \in S \Rightarrow p$ is a member of set S

$\mu(v) \Rightarrow$ a metric μ (e.g., number of plays in Q3) evaluated over video v

$\mu_S = \sum_{p \in S} \mu_p \Rightarrow \mu_S$ is the sum of μ_p for all publishers p in set S

$r(v) = \mu_1(v)/\mu_2(v) \Rightarrow r(v)$ is the ratio of two metrics $\mu_1(v)$, $\mu_2(v)$

$r_p, r_S \Rightarrow$ the same ratios over a single publisher p or set of publishers S

$$r_p = \left(\sum_{v \in p} \mu_1(v) \right) / \left(\sum_{v \in p} \mu_2(v) \right)$$

$$r_S = \left(\sum_{p \in S} \sum_{v \in p} \mu_1(v) \right) / \left(\sum_{p \in S} \sum_{v \in p} \mu_2(v) \right)$$

$$\bar{\rho}_p = \left(\sum_{v \in p} \rho(v) * w(v) \right) / \left(\sum_{v \in p} w(v) \right) \Rightarrow \text{a weighted sum.}$$

For instance, the average length of a video played weighted by the number of plays for each video, $\rho(v)$ would be the length of video, and the weight $w(v)$ is the number of plays. Since $\bar{\rho}_p$ is a ratio, it would also be possible to determine $\bar{\rho}_S$ for a set of publishers using the rule above.

Examples

Engagement is a ratio $r(v) = \mu_1(v)/\mu_2(v)$ where μ_1 is the number of times the video was watched some percentage of the way through (25, 50, 75, 100) and μ_2 is the number of times it was played.

Some metrics are more complex. For instance, μ may be the number of times a video that was of length greater than 10 minutes was watched on a tablet device. Only videos that are longer 10 minutes contribute to this total.

DISCLAIMERS & ASSUMPTIONS

Data is not aggregated across all videos or providers for vertical data, and only publishers with a meaningful amount of videos watched are included. Publishers with incomplete data for Q4 have been excluded.

When selecting items for inclusion in the report, Ooyala's data science team selected metrics that were clear and meaningful. Granular measures were broken down along many categories, which resulted in a large amount of data. Rather than reporting all of this data, the Ooyala team chose to highlight those measures that give a good impression for the data set as a whole.