



Q4 2017 Online Video and Pay-TV Trends Report:

Consumer Behavior Across Pay-TV, OTT, Connected Devices and Content Discovery



Introduction



TiVo enables pay-TV providers, broadcast networks, studios, digital publishers and consumer electronics (CE) manufacturers to power personalized search, recommendations, voice-based conversation, carousels and sports discovery, as well as gain invaluable insights into these features through analytics. TiVo's customers include AT&T, Charter, DIRECTV, DISH Network, Spectrum, The CW, Verizon and other leading global pay-TV providers and broadcast networks.

Each quarter, TiVo seeks real consumer opinions to uncover key trends relevant to pay-TV providers, digital publishers, broadcast networks, studios and CE manufacturers. Consumers' genuine, unbiased perspectives and feedback drive continuous improvements to TiVo's Personalized Content Discovery Platform, which leverages viewer behavior, dynamic metadata and voice recognition technology to provide highly intuitive entertainment discovery.

This survey has been conducted every quarter since 2012. It enables the company to track key trends in TV viewing habits, identify consumer opinions of pay-TV providers, and monitor emerging technologies, streaming devices, smart home devices, over-the-top (OTT) services, TV network apps and content discovery features (e.g., personalized recommendations). In addition to key quarter-over-quarter (q/q), year-over-year (y/y) and long-term trends, TiVo's *Q4 2017 Online Video and Pay-TV Trends Report* addresses many new topics and questions, including:

- The most popular smart speakers, and how respondents use them.
- Respondents' preferred devices for voice search, and if voice search helps them find something to watch.
- The evolving world of sports content, and whether streaming affects viewership of sporting events.
- A deep dive into sports viewers – who they are, and the viewing habits of respondents who stream sporting events.

SURVEY DEMOGRAPHICS

- Q4 2017 Survey Size: 3,330
- Geographic Regions: United States, Canada
- Age of Respondents: 18+

This survey was conducted in Q4 2017 by a leading third-party survey service; TiVo analyzed the results. TiVo conducts this survey on a quarterly basis and publishes a report evaluating and analyzing key trends across the pay-TV industry.

The sampling enabled herein provides the company with a cross-section of the population that is a statistical representation of the general pay-TV buying population of the United States and Canada. The margin of error is typically 2.0%. Trends that exceed this error rate are typically noted, and readers should exercise caution when attempting to interpret signals that are changing by values less than the margin of error.

The State of Pay-TV



RESPONDENTS WITHOUT PAY-TV SERVICE

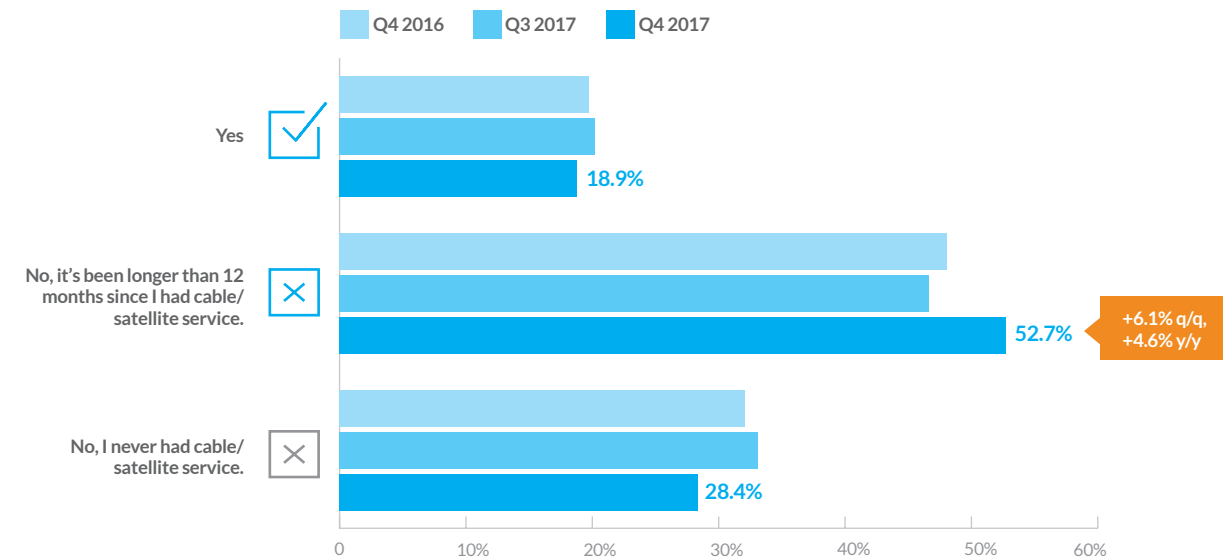
While this report focuses on how consumers interact with offerings from their pay-TV providers, TiVo first sought to understand the audience without pay-TV service. In Q4 2017, 85.2% of respondents subscribe to pay-TV service. Of those without pay-TV service, 18.9% cut service in the last 12 months. While the number of those who cut pay-TV service in the last year is at its lowest since Q3 2016 survey results, the answer choice, “No, it’s been longer than 12 months since I had cable/satellite service” increased 6.1 percentage points q/q and 4.6 points y/y. Are consumers cutting the cord and choosing not to re-subscribe to cable because they’re not missing it? TiVo will continue to track this trend for fluctuations in these two audiences. For pay-TV providers, subscriber retention remains crucial—as subscribers once lost may not return.

Who is your current cable/satellite service provider?

I have cable/satellite service I don't have cable/satellite service



Did you cut cable/satellite service in the last 12 months? (Only answered by respondents who do not have a pay-TV provider)



The State of Pay-TV

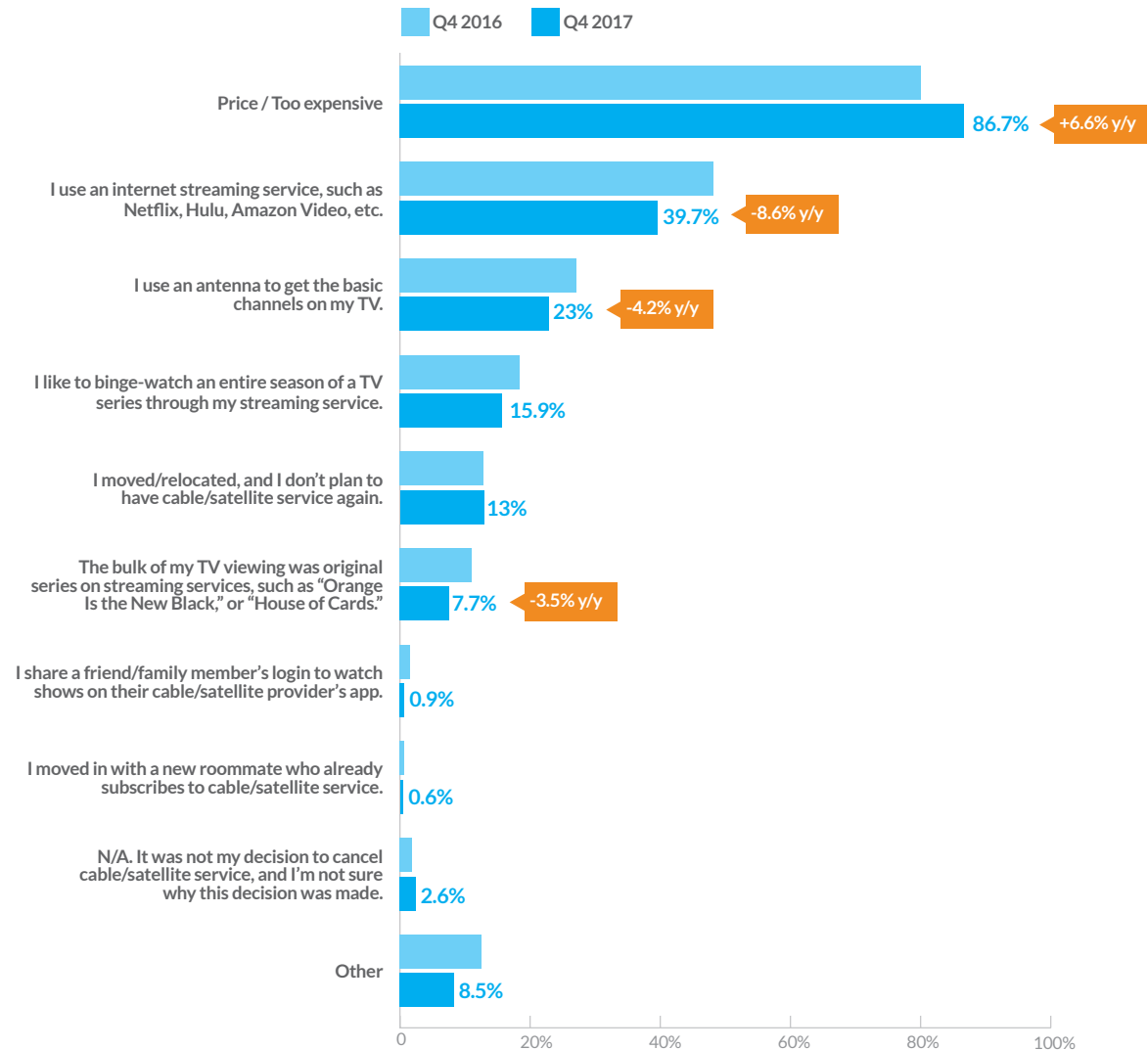


RESPONDENTS WITHOUT PAY-TV SERVICE (CONTINUED)

Why do respondents cancel pay-TV service? For the fifth quarter in a row, respondents cancel for the following top three reasons:

1. “Price - Too expensive” – 86.7%. This category increased 6.6% y/y, and is at its highest rate since the start of the question in Q3 2016.
2. “I use an internet streaming service, such as Netflix, Hulu, Amazon Video, etc.” – 39.7%. This category decreased 8.6 percentage points y/y.
3. “I use an antenna to get the basic channels on my TV.” – 23%. This category decreased 4.2 percentage points y/y.

What factors influenced your decision to cancel your cable/satellite service? (Choose all that apply)



The State of Pay-TV



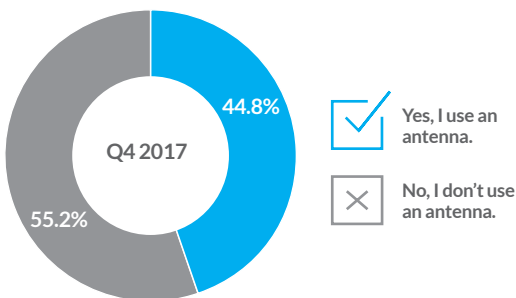
RESPONDENTS WITHOUT PAY-TV SERVICE (CONTINUED)

Price continues to drive respondents to cut pay-TV service, making TiVo wonder: what actions can pay-TV providers take to retain this audience? Are providers leveraging the necessary subscriber data to identify potential customers at high risk of churn, and are pay-TV providers targeting their marketing to this group in effort to combat this action?

Through the use of viewer data, pay-TV providers could do much more to craft targeted messaging for this audience. For instance, campaigns could educate customers on functionality not yet leveraged within current offerings, or present newly available offerings—both of these tactics could increase the perceived value of cable/satellite service.

Of those without pay-TV service, 44.8% of respondents use an antenna to watch over-the-air (OTA) TV. The audience using antennas has experienced minimal growth, lingering in the 44% to 45% range for the past six quarters.

Do you use an antenna to access the basic channels on your TV?

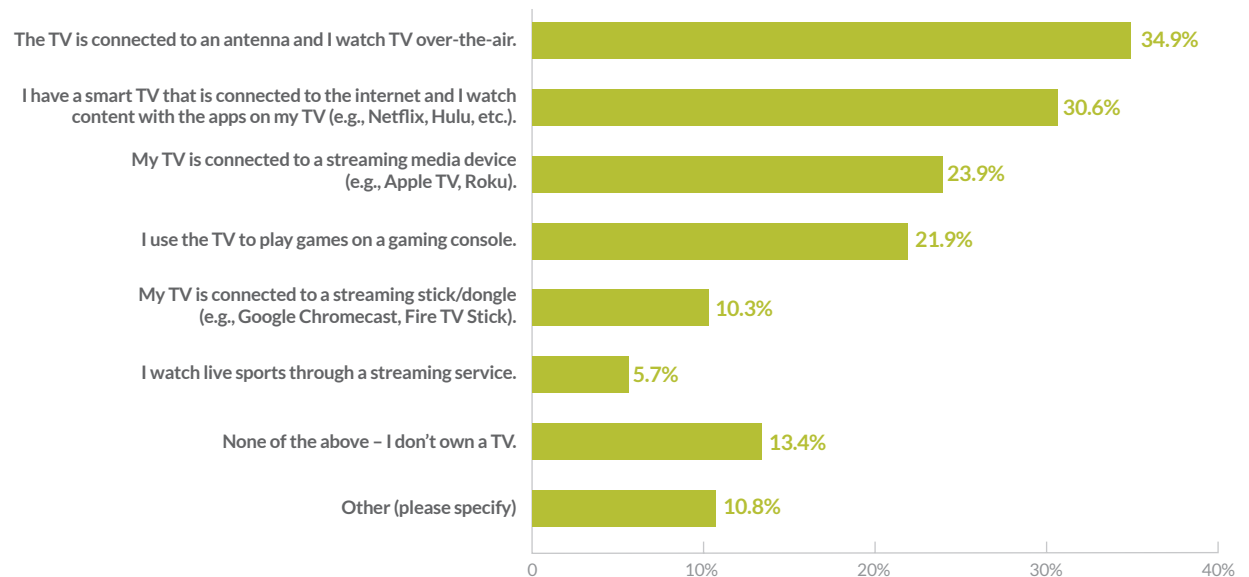


For the third quarter in a row, the top three ways respondents without pay-TV service use their TVs are:

1. "The TV is connected to an antenna and I watch TV over-the-air." – 34.9%
2. "I have a smart TV that is connected to the internet and I watch content with the apps on my TV (e.g., Netflix, Hulu, etc.)" – 30.6%
3. "My TV is connected to a streaming media device (e.g., Apple TV, Roku)." – 23.9%

Based on these answer choices, it's clear that respondents are leveraging the streaming market and using SVOD services to fill the gap created by cutting their pay-TV service. Also, since initially adding this question to the survey, the options available to stream sporting events have grown significantly, even though attaining the broadcast rights to do so is both challenging and expensive. TiVo considers this a must-track viewing category, and the Q4 2017 survey introduced a new answer choice: "I watch live sports through a streaming service." While only 5.7% of respondents selected sports streaming as a way in which they use their TV, TiVo anticipates considerable future growth in this area and will continue to monitor it.

How do you use your TV screen(s) that are not connected to a pay-TV service? (Choose all that apply)



The State of Pay-TV



RESPONDENTS WITH PAY-TV SERVICE

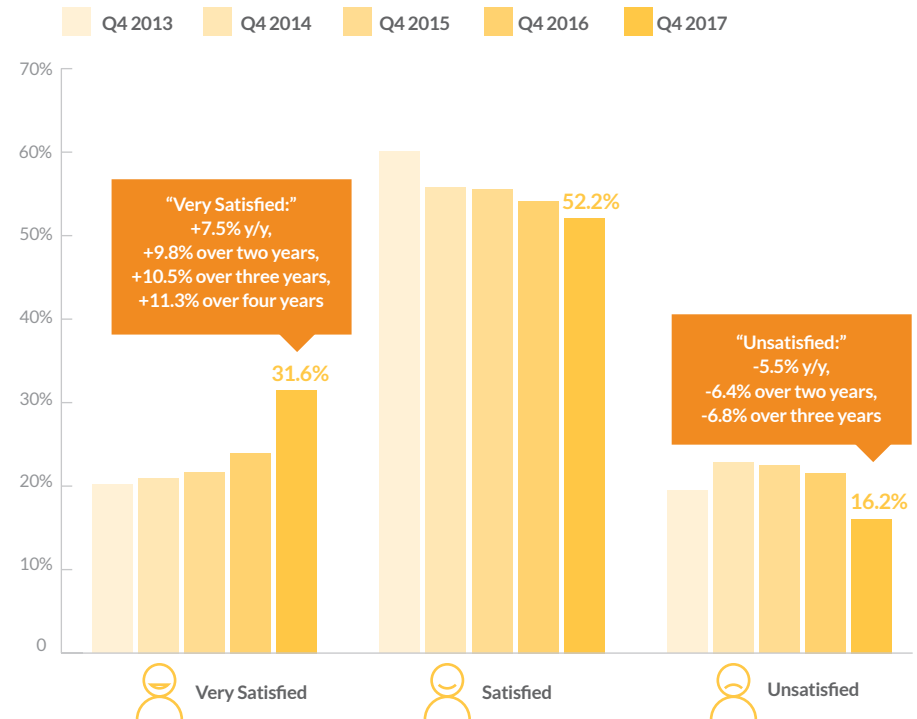
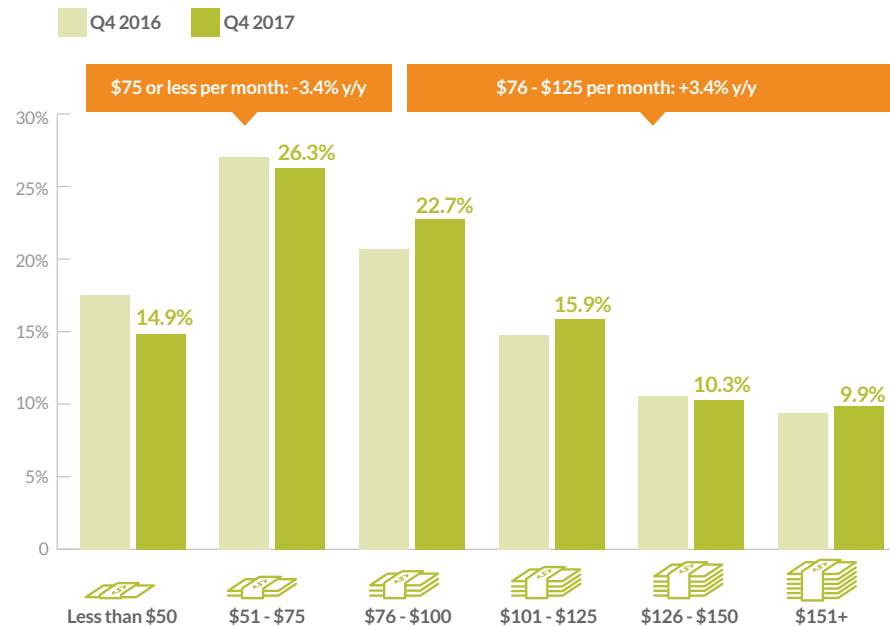
With high-cost being a key reason causing respondents to cut pay-TV service, it's important to keep a pulse on current payment structures for those with cable/satellite service. In Q4 2017, respondents report the following pricing information:

- Nearly half of respondents (49%) pay \$51 to \$100 per month for cable/satellite service.
- Another 20% pay \$126 or more per month for cable/satellite service.
- Those who pay \$75 or less decreased 3.4 percentage points y/y.
- Those who pay \$76 to \$125 increased 3.4 percentage points y/y.

Over half (52.2%) of respondents with pay-TV service are "satisfied with the service." Another 31.6% are "very satisfied with the service," an answer choice that increased 7.5 percentage points y/y, 9.8 points over two years, 10.5 points over three years and 11.3 points over four years. In other positive news for pay-TV providers, the number of respondents who answered "unsatisfied with the service" decreased 5.5 percentage points y/y, 6.4 points over two years and 6.8 points over three years.

How would you rate the level of value you are receiving from your cable/satellite service provider?

How much is your monthly cable/satellite bill for TV services only? (Not including video-on-demand/movie purchases, phone or internet)



The State of Pay-TV



RESPONDENTS WITH PAY-TV SERVICE (CONTINUED)

Of the 16.2% of respondents who are unsatisfied, the top three reasons for dissatisfaction are:

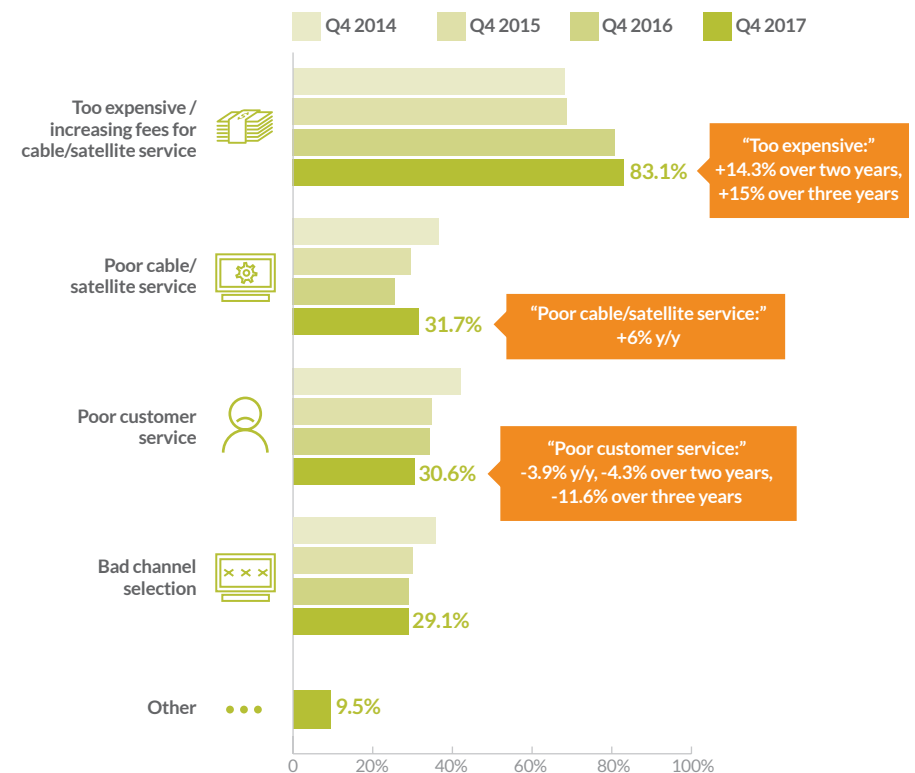
1. Too expensive / Increasing fees for cable/satellite service – 83.1%
2. Poor cable/satellite service – 31.7%
3. Poor customer service – 30.6%

Why are respondents dissatisfied? A few notable trends include:

- Price remains the top reason for dissatisfaction, and the long-term outlook is not positive. Dissatisfaction with price increased slightly y/y, 14.3 percentage points over two years and 15 points over three years.
 - Though previously mentioned, it’s worth noting again that of those respondents cutting pay-TV service, 86.7% do so because of price, and this category increased by 6.6 percentage points y/y. As price drives both dissatisfaction and cord-cutting, these two results support the view that some respondents can’t justify the high price of cable/satellite service, especially with the availability of lower-cost options like Netflix and Hulu. Now that these services also offer original content, streaming also cuts into the daily viewing time of pay-TV services, potentially leading to a deterioration of perceived value. Pay-TV providers must act before consumers reach their tipping point.
- After falling out of the top three in Q3 2017, “poor cable/satellite service” reappears in the top three reasons respondents are dissatisfied—an increase of 6 percentage points since the Q4 2016 report.
- While “poor customer service” remains in the top three, it decreased 3.9 percentage points y/y, 4.3 points over two years and 11.6 points over three years.

While TiVo understands it is difficult, if not impossible, for pay-TV providers to lower the cost of service for existing customers, TiVo believes stronger efforts can be made to educate subscribers on functionality they may not be using—for example, introducing channels and/or valuable content they’re not currently watching, catch-up TV or TV Everywhere offerings. Targeted, educational marketing powered by real viewer data should be a high priority for all pay-TV providers.

Why do you feel you’re not getting enough value from your provider? (Choose all that apply)



The State of Pay-TV



POTENTIAL CHURN

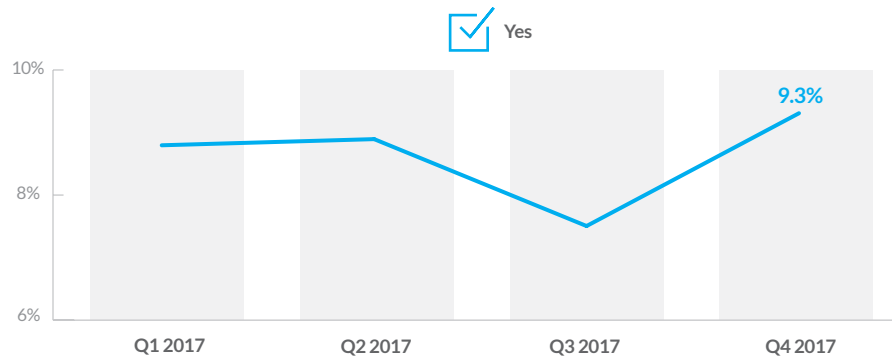
Of the respondents with pay-TV service, 9.3% switched cable/satellite providers in the last three months, marking the highest result for this answer choice in all of 2017.

Respondents were asked if they are planning to change pay-TV providers in the next six months, and the results include:

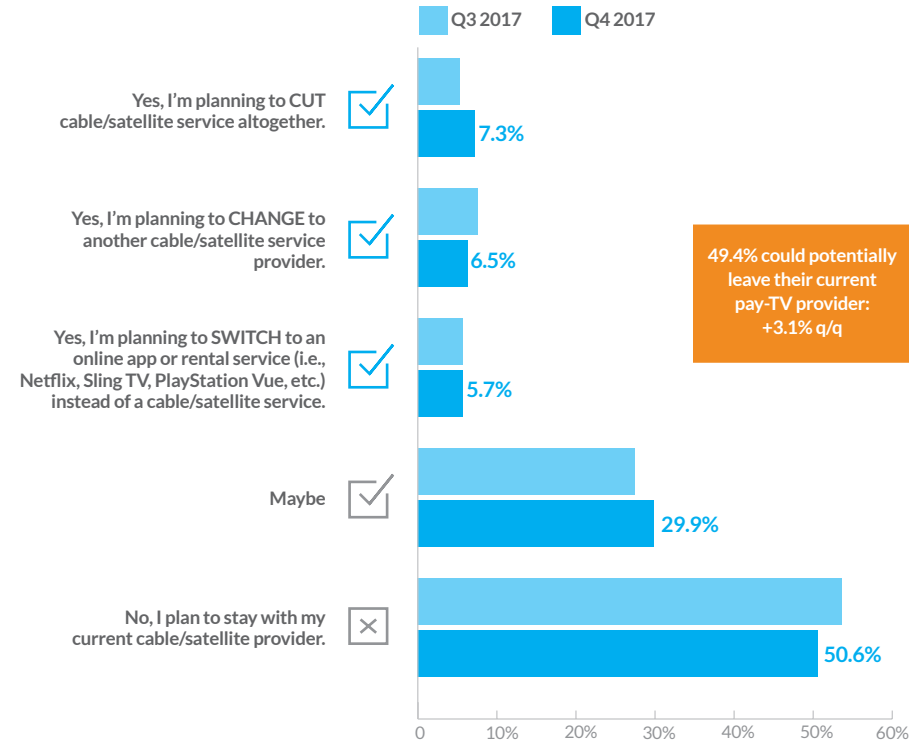
- 7.3% plan to **cut** their pay-TV service, a category that experienced a slight increase q/q.
- 6.5% plan to **change** to another pay-TV provider.
- 5.7% plan to **switch to an online service or app**.
- 29.9% are **on the fence**, answering “maybe”—a category that experienced a slight increase q/q.

These figures total 49.4% of respondents with pay-TV service—meaning nearly half could potentially leave their current provider in the next six months, and this group increased 3.1 percentage points q/q.

Have you switched cable/satellite providers in the last three months?



Do you plan to change cable/satellite providers in the next six months?



The State of Pay-TV

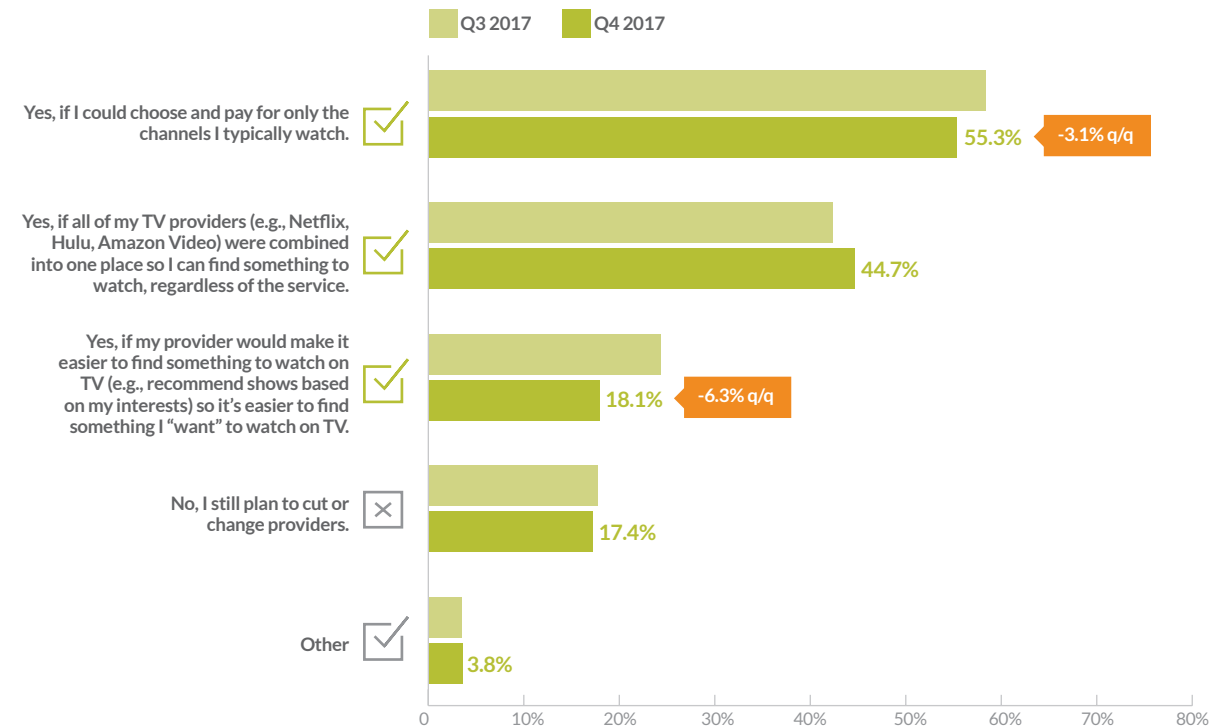


POTENTIAL CHURN (CONTINUED)

It is important to consider what pay-TV providers could do to keep these respondents as customers. The Q4 2017 survey results showed an interesting trend:

- The top reason respondents would stay is, “Yes, if I could choose and pay for only the channels I typically watch.” However, this audience decreased 3.1 percentage points q/q.
- While the results declined, over half (55.3%) of respondents are interested in this type of à la carte pay-TV package. This result brings up price once again, as it points out that current pay-TV package pricing does not reflect perceived value of service.

Would you consider keeping your existing cable/satellite service provider if they allowed you to do the following? (Choose all that apply)



À La Carte Pay-TV Packages



In Q4 2017, 81.3% of respondents indicated that they would like the ability to only pay for the channels they want to watch, an increase of 4.7 percentage points y/y and 7.7 points over two years. On average, here is a snapshot of how all respondents want to pay for à la carte packages:

- **Package Cost:** \$33.09 total per month—an increase of 6.2% q/q
- **Channel Cost:** \$1.50 per channel, per month—an increase of 5.6% q/q
- **Number of Channels:** An average of 22 channels, which is flat q/q

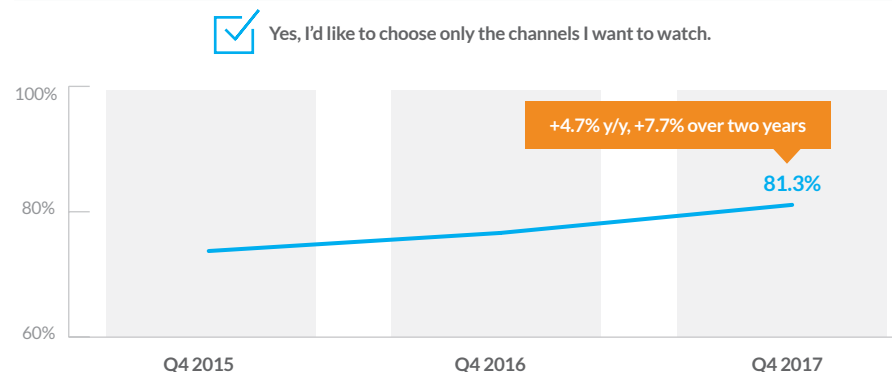
Though seasonality likely played a factor in these survey results, it's worth highlighting that the NHL Network and the SEC Network are new to the top 10 channels respondents will pay the most to watch. (The NFL Network was on the list in Q3 2017.) TiVo will continue to monitor whether these sports networks remain among the top 10 channels. Also, the results illustrate that respondents desire a considerably lower price for HBO, Cinemax and Starz than the current subscription price for any of these services.

Because the report surveys respondents in both the U.S. and Canada, the charts on pages 10-11 are displayed by country. Though much of the video content is the same in both countries, some Canadian content is unavailable in the U.S. Here is a breakdown of the Q4 2017 à la carte results by region (see charts on pages 10-11):

- **U.S.:** The average price respondents want to pay for a package of self-selected channels is \$35.87 per month—or \$1.50 per channel per month. On average, U.S. respondents chose 24 channels to compose an ideal line-up.
- **Canada:** The average price respondents want to pay for a package of self-selected channels is \$27.67 per month—or \$1.46 per channel per month. On average, Canadian respondents chose 19 channels to compose an ideal line-up.

Interestingly, the ideal price of \$35.87 (for U.S. respondents) for an à la carte package compares to the price of many vMVPD services offered today, such as YouTube TV and Sling TV. Pay-TV providers should offer competitive packages within this desired price range, both to please their customer base and to compete with offers from vMVPDs.

When purchasing cable/satellite service, you often choose from pre-set channel packages. Would you like the ability to make your own package by selecting ONLY the channels you WANT to watch?



TOP 10 MOST POPULAR CHANNELS	POPULARITY
1. ABC	60.2%
2. FOX	54.2%
3. CBS	53.7%
4. Discovery Channel	50.8%
5. A&E	50.2%
6. HBO	49.6%
7. NBC	47.7%
8. History	47.5%
9. Food Network	41.9%
10. AMC	41%

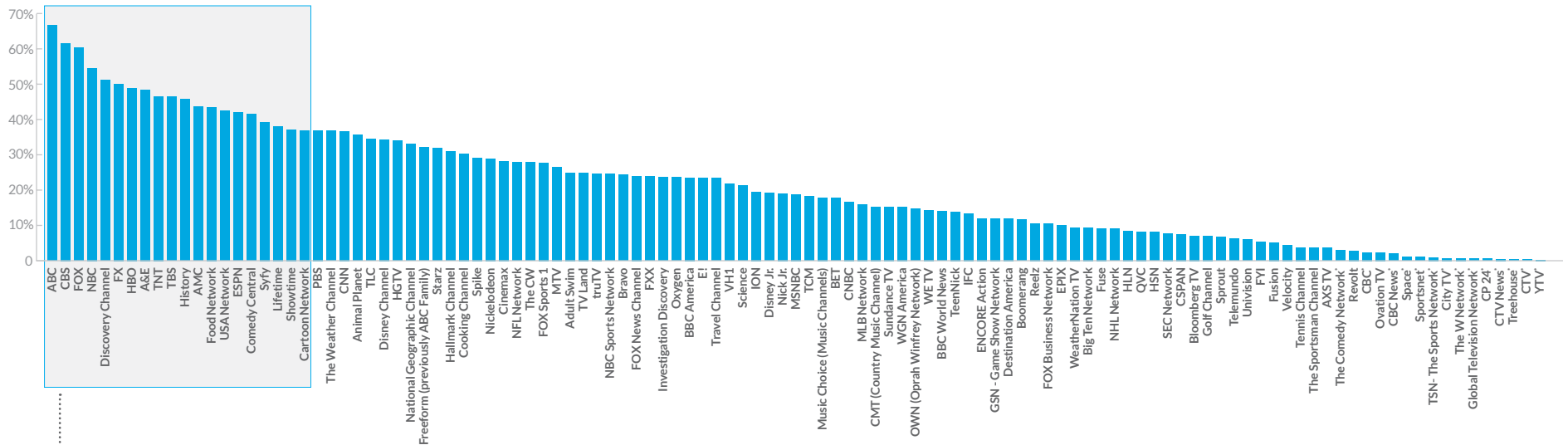
TOP 10 CHANNELS RESPONDENTS WILL PAY THE MOST TO WATCH	PRICE PER CHANNEL
1. HBO	\$2.58
2. Cinemax	\$2.22
3. Starz	\$2.19
4. Showtime	\$2.09
5. Revolt	\$2.00
6. Treehouse (Canada only)	\$1.98
7. NHL Network	\$1.96
8. NFL Network	\$1.95
9. BET	\$1.90
10. SEC Network	\$1.87

À la Carte Pay-TV Packages



IDEAL CHANNELS IN AN À LA CARTE PAY-TV PACKAGE - U.S.

If YES, which channels would you be interested in including in your TV package? (Choose all that apply)



Q4 2017		
Top 20 Channels Among U.S. Respondents	Popularity Among U.S. Respondents	Price Per Channel
ABC	66.6%	\$1.46
CBS	61.6%	\$1.26
FOX	60.3%	\$1.44
NBC	54.6%	\$1.20
Discovery Channel	51.2%	\$1.43
FX	50.1%	\$1.45
HBO	48.9%	\$2.82
A&E	48.4%	\$1.43
TNT	46.6%	\$1.25
TBS	46.5%	\$1.21
History	45.8%	\$1.42
AMC	43.7%	\$1.48
Food Network	43.6%	\$1.54
USA Network	42.5%	\$1.31
ESPN	42%	\$1.75
Comedy Central	41.6%	\$1.38
Syfy	39.3%	\$1.43
Lifetime	38.2%	\$1.52
Showtime	37.2%	\$2.49
Cartoon Network	37%	\$1.48
Total		\$30.75

Q3 2017		
Top 20 Channels Among U.S. Respondents	Popularity Among U.S. Respondents	Price Per Channel
ABC	66.3%	\$1.26
CBS	63.6%	\$1.20
FOX	59.4%	\$1.43
NBC	55.4%	\$1.20
Discovery Channel	51.5%	\$1.32
FX	49.2%	\$1.37
A&E	47.8%	\$1.39
HBO	46.3%	\$2.78
TBS	46.3%	\$1.26
History	46%	\$1.32
TNT	45.6%	\$1.25
USA Network	44.1%	\$1.26
AMC	43.5%	\$1.42
Syfy	40.4%	\$1.33
Food Network	40%	\$1.57
The Weather Channel	39.7%	\$1.10
ESPN	39.6%	\$1.84
Comedy Central	38.6%	\$1.46
PBS	36%	\$1.16
Animal Planet	35.6%	\$1.28
Total		\$28.22

+8.2% q/q

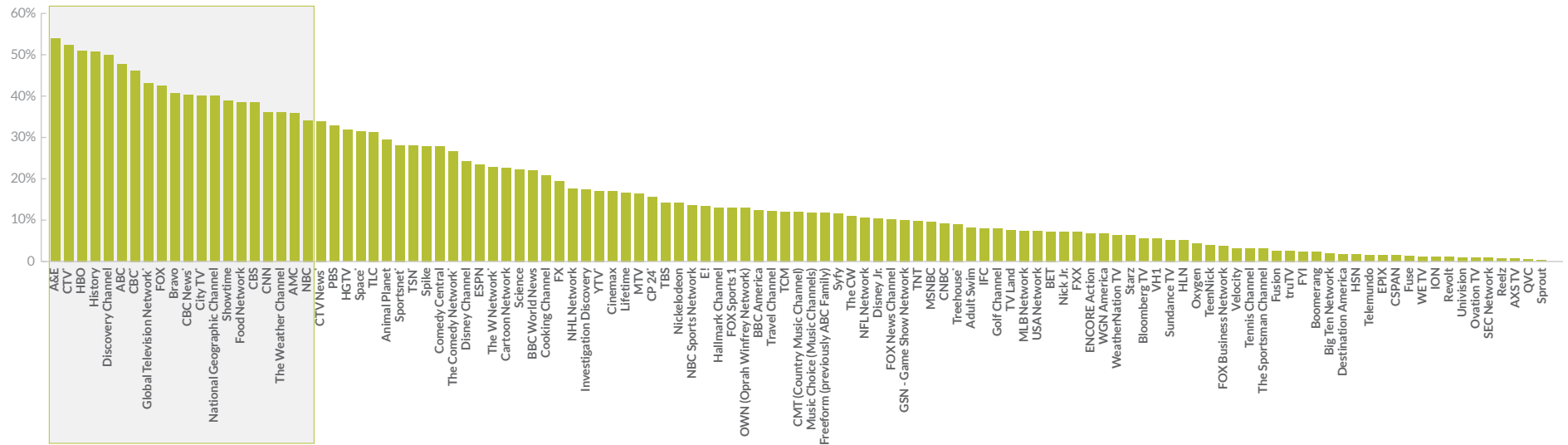
*Canada Only

À la Carte Pay-TV Packages



IDEAL CHANNELS IN AN À LA CARTE PAY-TV PACKAGE - CANADA

If yes, which channels would you be interested in including in your TV package? (Choose all that apply)



Q4 2017		
Top 20 Channels Among Canadians	Popularity Among Canadians	Price Per Channel
A&E	53.9%	\$1.39
CTV	52.4%	\$1.14
HBO	51%	\$2.15
History	50.7%	\$1.50
Discovery Channel	49.9%	\$1.54
ABC	47.7%	\$1.22
CBC	46.2%	\$1.21
Global Television Network	43.2%	\$1.18
FOX	42.5%	\$1.29
Bravo	40.7%	\$1.31
CBC News	40.4%	\$1.33
City TV	40.1%	\$1.21
National Geographic Channel	40.1%	\$1.57
Showtime	38.9%	\$1.35
Food Network	38.6%	\$1.45
CBS	38.5%	\$1.14
CNN	36.2%	\$1.46
The Weather Channel	36.1%	\$1.15
AMC	35.9%	\$1.38
NBC	34.2%	\$1.10
Total		\$27.07

Q3 2017		
Top 20 Channels Among Canadians	Popularity Among Canadians	Price Per Channel
CTV	55.5%	\$1.14
A&E	53.7%	\$1.19
Discovery Channel	53.2%	\$1.33
HBO	52.3%	\$2.11
History	50.2%	\$1.34
CBC	48.7%	\$1.24
ABC	45.3%	\$1.12
City TV	44.7%	\$1.08
Global Television Network	42.9%	\$1.13
Bravo	42.3%	\$1.22
CBC News	42.2%	\$1.21
FOX	41.9%	\$1.16
Food Network	41.1%	\$1.21
Showtime	39.6%	\$1.44
CNN	39.1%	\$1.20
CBS	38.7%	\$1.00
National Geographic Channel	37.7%	\$1.29
The Weather Channel	36.8%	\$0.98
NBC	36.1%	\$1.11
CTV News	34.5%	\$1.18
Total		\$24.68

+8.8% q/q

*Canada Only

TV Viewing Habits



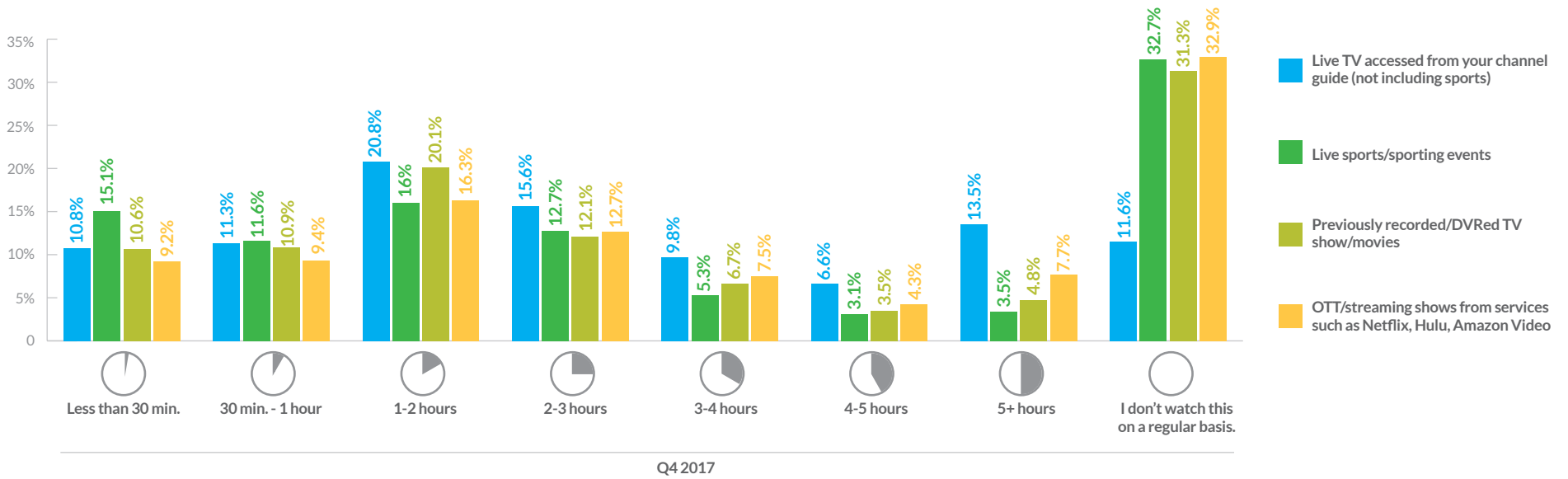
According to Q4 2017 survey results, respondents' daily TV-viewing behavior is as follows:

- 88.4% watch “live TV accessed from your channel guide (not including sports)”
- 68.7% watch “previously recorded/DVRed TV shows/movies”
- 67.3% watch “live sports/sporting events”
- 67.1% watch “OTT/streaming shows from services such as Netflix, Hulu, Amazon Video”
- Across all four categories of video content, the largest audiences watched 1 to 2 hours per day.

Q4 2017 marks the first survey to include “live sports/sporting events” as an answer choice, and its high response rate, which beat out OTT/streaming services and fell just below DVRed content, illustrates the popularity of sports content. With 67.3% of respondents watching, sporting events are clearly consumed at a high rate on a daily basis by pay-TV customers.

As the competitive landscape for sports-broadcasting rights heats up, pay-TV providers must simplify how viewers find their favorite teams and sporting events as well as ramp up the promotion of sports/games that are only available on cable/satellite service (not through a streaming service), in an effort to continuously improve viewers' perceived value of their pay-TV service.

On average, how much of your daily TV viewing time is spent watching the following types of TV?



TV Viewing Habits



SENTIMENTS ON CURRENT PAY-TV CONTENT AND NEXT-GEN USER EXPERIENCES

Current Pay-TV Offerings

Respondent satisfaction with pay-TV service can be gauged with a variety of metrics, but two crucial measurements are whether viewers see value in the content offered to them, and whether they are able to watch the content. When respondents cannot watch their pay-TV content, perceived value diminishes over time. This trends summary shows how respondents feel about their ability to watch their cable/satellite service:

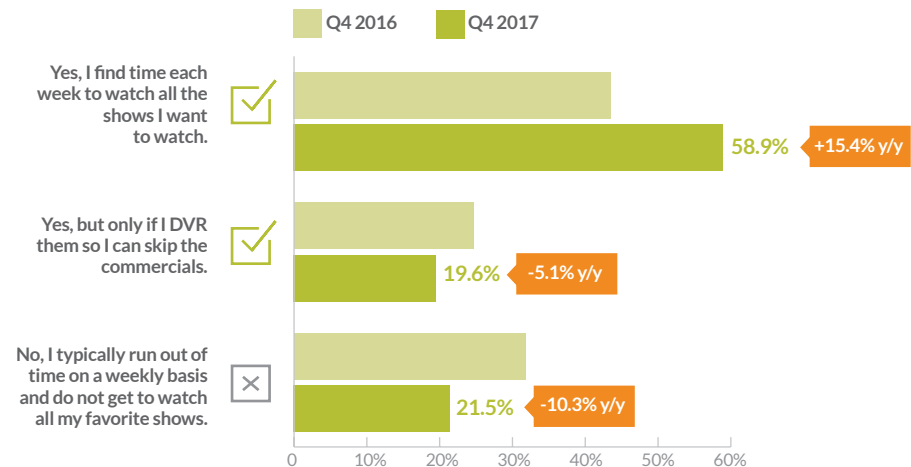
- 58.9% have enough time to watch TV—this category increased 15.4 percentage points y/y.
- Another 19.6% have enough time to fit in all their favorite shows, but only if they DVR/record them to skip the commercials—this group decreased 5.1 percentage points y/y.
- Those who run out of time each week decreased 10.3 percentage points y/y, which is good news for pay-TV providers. When consumers actually have time to watch the content offered to them, perceived value of pay-TV service can be affected, and ultimately improve satisfaction levels.

Next-Gen Pay-TV User Experiences

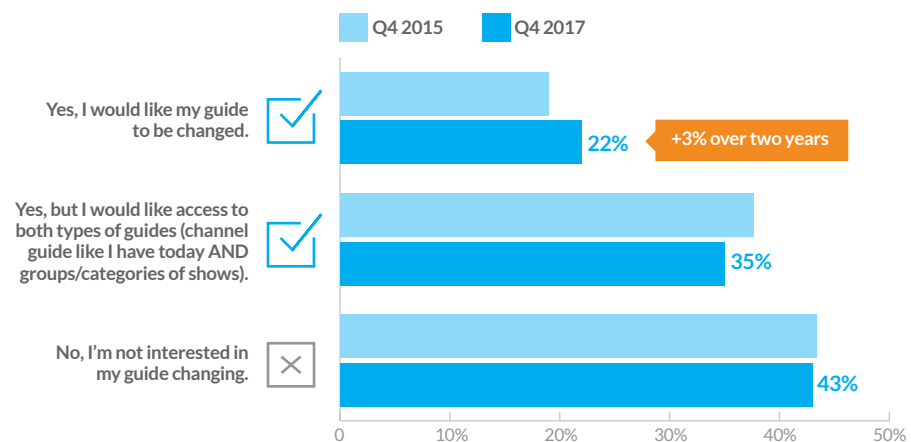
Since pay-TV providers rely so heavily on the traditional channel guide, TiVo wanted to provide insight into how respondents feel about the newer carousel format (categorized groups of content) offered by many online video providers today. The results are as follows:

- 57% of respondents would like their guide changed to a carousel format of sorted and categorized groups/lists of TV shows and movies.
 - Just over a third of those desiring a carousel format (35%) would like access to both their traditional pay-TV guide and the carousel format.
- While the answer choice “Yes, I would like my guide to be changed” has been flat more recently, it increased three percentage points over survey results two years ago.

On average each week, do you feel you have enough time to watch all your favorite TV shows?



Would you like your channel guide to be changed, so that it's sorted or categorized into groups/lists of TV shows or movies? For example, "What is on Now," "Because You Watched This," "Live Sports On Now."



TV Viewing Habits

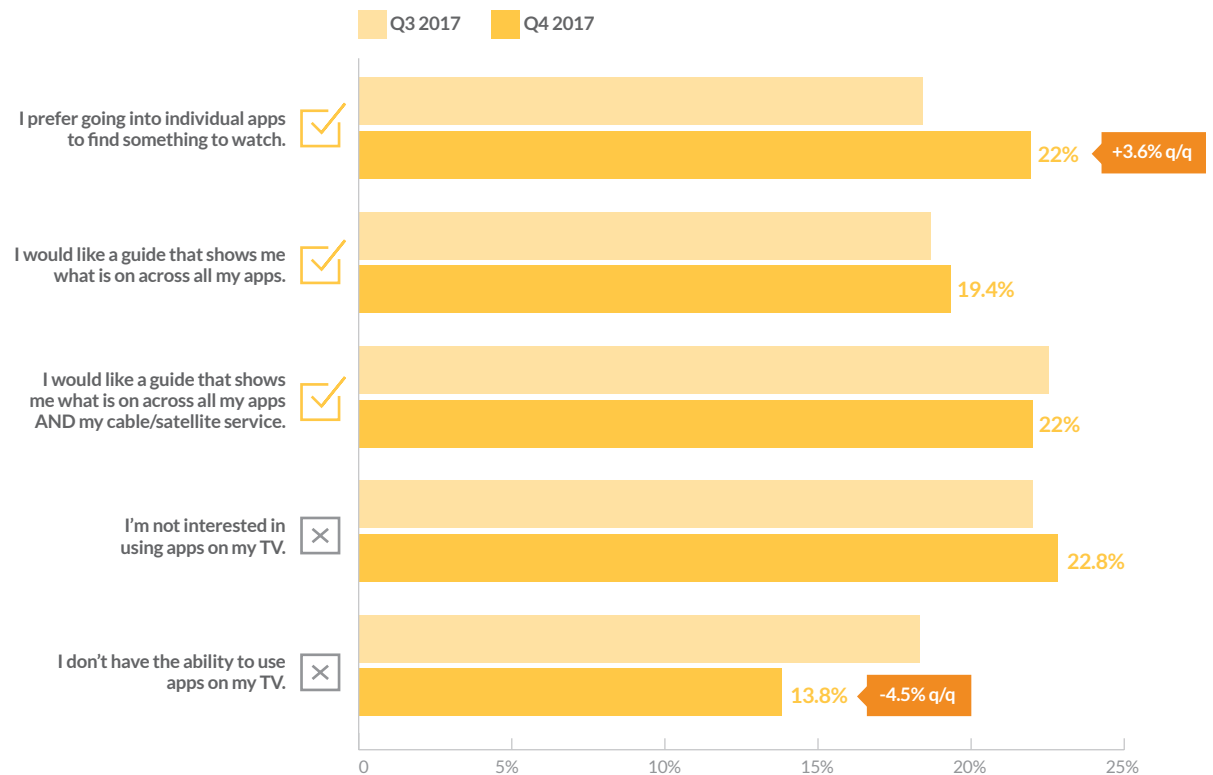


SENTIMENTS ON CURRENT PAY-TV CONTENT AND NEXT-GEN USER EXPERIENCES (CONTINUED)

OTT streaming apps (Netflix, Hulu, etc.) continue to gain traction among consumers and are increasingly accessed in the home via smart TVs. Thus, the need for cross-catalog viewer experiences, or combining both pay-TV and OTT video content, is becoming more important. While straying from the traditional pay-TV guide is a daunting task, pay-TV providers should be aware of how consumers feel about this change. In Q4 2017, the survey reported the following:

- 22% of respondents would like a cross-catalog guide that shows them what content is available across both their TV apps and pay-TV service.
- Another 19.4% would like a guide that shows what's on across multiple apps.
- Those without the ability to use apps on their TV (13.8%) declined 4.5 percentage points q/q. Is this because more smart TVs are in homes than ever before, or because awareness of this functionality is increasing? TiVo will continue to observe this trend, but it could be positive news for streaming providers.

Do you prefer using individual TV apps (Netflix, Hulu, etc.) to find something to watch, or would you prefer a unified guide-like format that combines all of your available content into a single guide that shows all app content (Netflix, Hulu, etc.) and cable/satellite content?



OTT Trends: Subscription and Transactional Video-on-Demand (SVOD and TVOD)

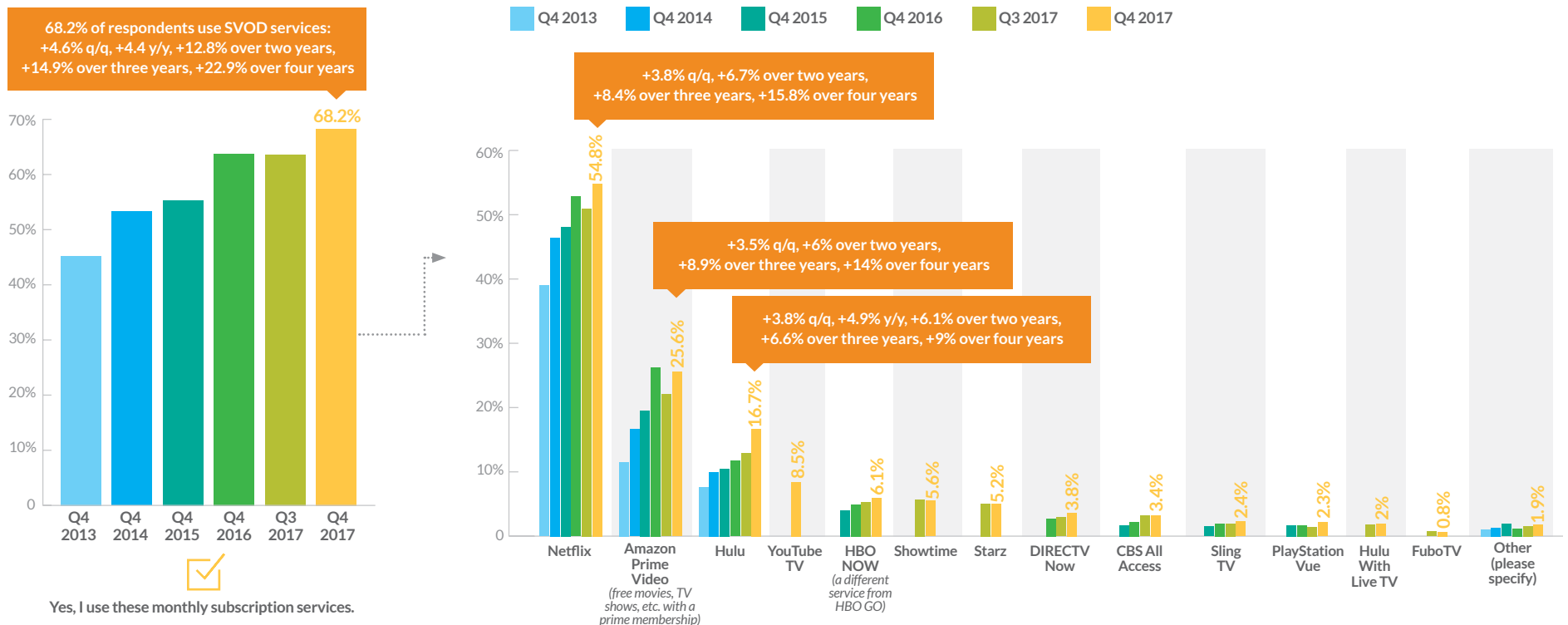


SVOD MARKET SHARE AND ADOPTION

In Q4 2017, SVOD adoption across the three main categories of respondents is broken down as follows:

- 68.2% of all respondents use an SVOD service, an increase of 4.6 percentage points q/q, 4.4 points y/y, 12.8 points over two years, 14.9 points over three years and 22.9 points over four years.
- 69.5% of respondents with pay-TV service are what TiVo refers to as “cord-cheaters” (those who have cable/satellite service and also use one or more SVOD services); this group increased 4.8 percentage points q/q.
- 63.8% of cord-cutters and/or cord-nevers (those who don’t subscribe to cable/satellite service) have one or more SVOD subscriptions; this group increased 3.2 percentage points q/q.

Do you use any of these monthly subscription services for movies or TV shows? (Choose all that apply)



OTT Trends: SVOD and TVOD



SVOD MARKET SHARE AND ADOPTION (CONTINUED)

The top three most-used SVOD services are Netflix, Amazon Prime Video and Hulu. Several growth trends worth noting include:

- Amazon Prime Video experienced increases of 3.5 percentage points q/q, 6 points over two years, 8.9 points over three years and 14 points over four years.
- Hulu experienced increases of 3.8 percentage points q/q, 4.9 points y/y, 6.1 points over two years, 6.6 points over three years and 9 points over four years.
- Netflix saw growth of 3.8 percentage points q/q, 6.7 points over two years, 8.4 points over three years and 15.8 points over four years.
- YouTube TV was a new answer choice in Q4 2017. It experienced notable adoption at 8.5% and jumped to the fourth most-popular SVOD service, beating out several services that have been around for some time now, such as Sling TV, DirecTV NOW and CBS All Access.
- CBS All Access, DirecTV NOW and HBO NOW didn't experience huge growth q/q or y/y, but Q4 2017 results showed the highest adoption yet since being added to the survey.

In the Q3 2017 *Online Video and Pay-TV Trends Report*, TiVo discussed how growth was slowing for some SVOD services, as well as the possibility of market saturation. Though only the major SVOD players saw notable gains, this quarter's results illustrate room for growth. Still, the question remains: can newer services stay in the game? FuboTV remained flat q/q, despite the Q4 survey running during NFL season. Meanwhile, YouTube continues to capitalize on its existing subscriber base, increasing the exposure to ads for YouTube TV by showing them to viewers while they watch short-form content on the site.

It's important for pay-TV providers to constantly keep a pulse on their competitors, and with more video options available today than ever, TiVo wanted to analyze the most popular SVOD services used by those abandoning cable/satellite service and those supplementing their cable/satellite service. The chart below shows a breakdown of SVOD services used by cord-cutters and cord-cheaters. Again, the newly added YouTube TV is in good position, ranking fourth in both groups, and even more popular among cord-cheaters. One question TiVo asks is: are pay-TV subscribers testing out YouTube TV while considering cutting the cord?

	CORD-CUTTERS (NO PAY-TV SERVICE)	CORD-CHEATERS (SUBSCRIBE TO PAY-TV SERVICE)
Netflix	83.3%	79.4%
Amazon Prime	34.1%	38.1%
Hulu	27.4%	23.8%
YouTube TV	10.2%	12.9%
HBO NOW	4.5%	9.9%
Starz	2.5%	8.7%
Showtime	2%	9.5%
FuboTV	0%	1.4%
Other	4.7%	2.3%

OTT Trends: SVOD and TVOD



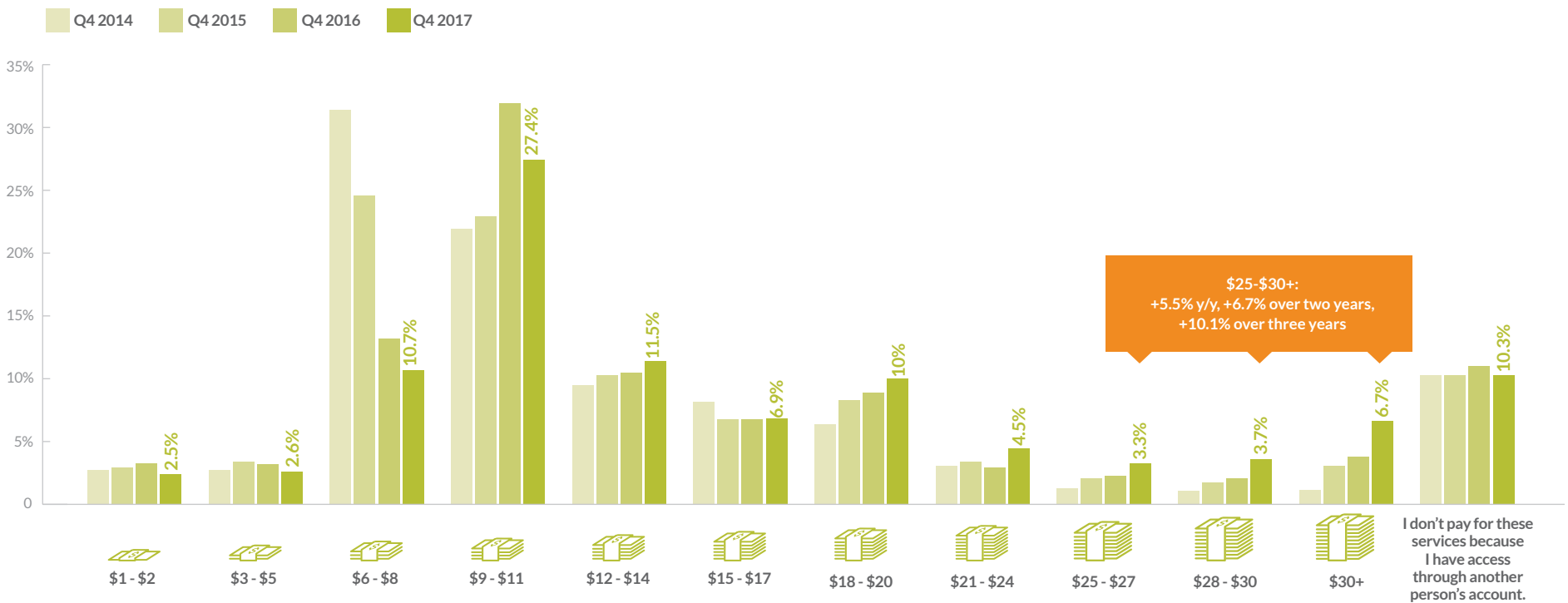
SVOD ENGAGEMENT

Not only did overall SVOD adoption experience positive growth, but engagement, including monetary spend and viewing time, did as well.

Monthly Spend

- The largest group (38.9%) of respondents spend \$9 to \$14 each month on SVOD services.
- While only 13.7% of respondents spend \$25 or more each month on SVOD services, this category increased slightly q/q, 5.5 percentage points y/y, 6.7 point over two years and 10.1 points over three years.

How much do you spend each month on subscription services? (Combined spend on Netflix, Hulu, etc.)



OTT Trends: SVOD and TVOD

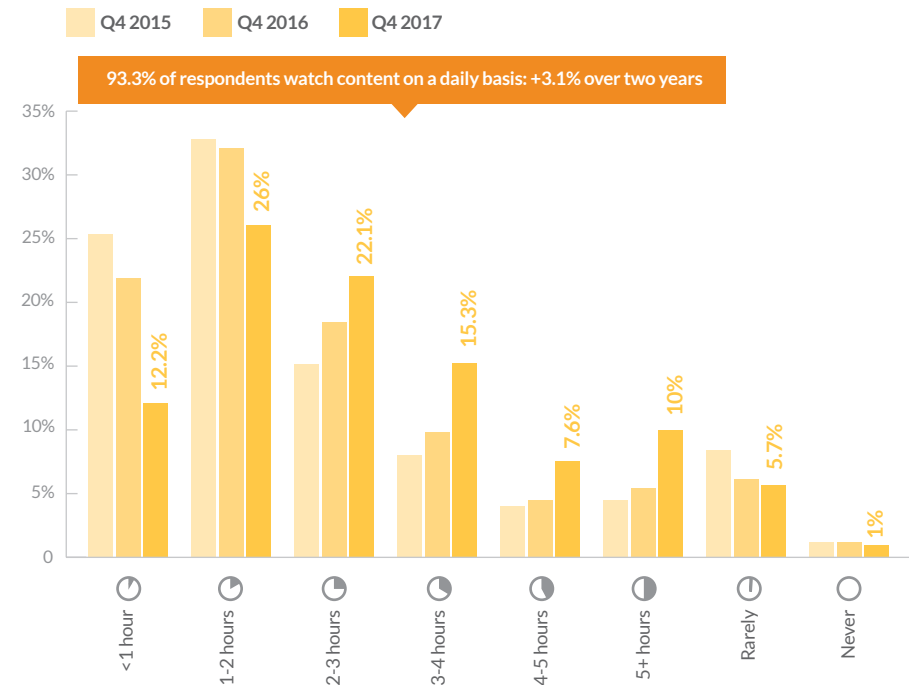


SVOD ENGAGEMENT (CONTINUED)

Viewing Time

- 93.3% of respondents who subscribe to SVOD services watch content on a daily basis, an increase of 3.1 percentage points over viewing two years ago.
- Nearly half (48.1%) of respondents watch 1 to 3 hours of SVOD content per day. Based on the findings below, it appears respondents are spending more time watching content through SVOD services.
 - “Less than 1 hour” decreased 9.7 percentage points y/y and 13.2 points over two years.
 - “1-2 hours” decreased 6.1 percentage points y/y and 6.8 points over two years.
 - “2-3 hours” increased 3.6 percentage points y/y and 6.9 points over two years.
 - “3-4 hours” increased 5.4 percentage points y/y and 7.2 points over two years.
 - “4-5 hours” increased 3 percentage points y/y and 3.5 points over two years.
 - “5+ hours” increased 4.5 percentage points y/y and 5.4 points over two years.
 - The answer choices “rarely” and “never” experienced slight declines y/y and 3.1 percentage points over two years.

On average, how many hours per day do you watch content on these subscription services?



OTT Trends: SVOD and TVOD



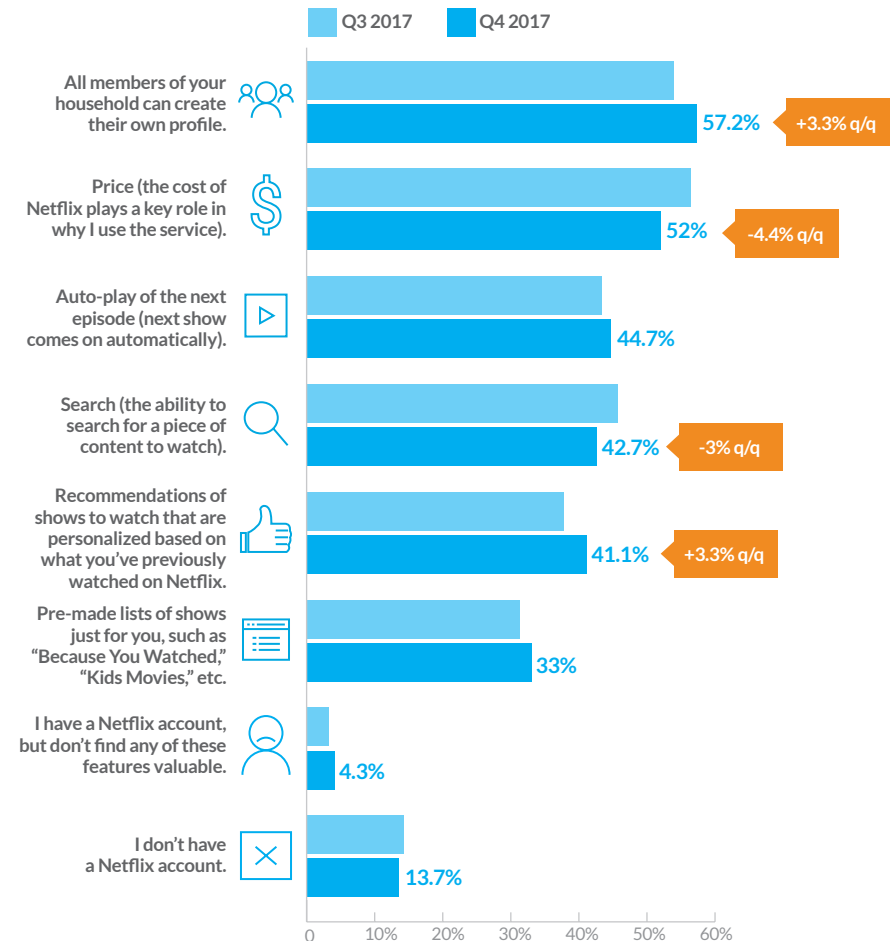
Netflix endures as the clear leader in the SVOD industry, and therefore, it's important to understand why respondents enjoy the service. A few notable trends of Netflix's service are:

1. "All members of your household can create their own profile." —57.2%, with an increase of 3.3 percentage points q/q.
2. "Price (The cost of Netflix plays a key role in why I use the service)." —52%, with a decrease of 4.4 percentage points q/q.
3. "Auto-play of the next episode (next show comes on automatically)." —44.7%
4. "Recommendations of shows to watch that are personalized based on what you've previously watched on Netflix"—41.1%, with an increase of 3.3 percentage points q/q.
5. "Search (the ability to search for a piece of content to watch)" —42.7%, with a decrease of 3 percentage points q/q.

While price remains one of the top three reasons why respondents subscribe to Netflix, it actually decreased 4.4 percentage points q/q. This decrease could be a direct result of Netflix's recent price increase. However, the price jump did not affect Netflix's sustained positive growth in adoption, and over half of respondents still consider the service's low cost to be an appealing feature. This is in contrast to the fact that price is among the top reasons for dissatisfaction with pay-TV service, whereas price is among the top contributors to Netflix's success.

Meanwhile, following Netflix's price increase, in early Q1 2018 Amazon announced a price increase for its Prime members who pay monthly¹. However, the monthly fee for Amazon Prime Video-only memberships is not changing and will remain at \$8.99. Will Amazon Prime Video continue to see positive growth with this change? TiVo believes this will not likely have a huge impact, but will monitor it for a decline in adoption post-price change.

If you are a Netflix subscriber, which of Netflix's features do you find appealing? (Choose all that apply)



¹ Ben Munson, "[Amazon Prime raising monthly subscription costs by about 20%.](#)" FierceCable, January 19, 2018

OTT Trends: SVOD and TVOD

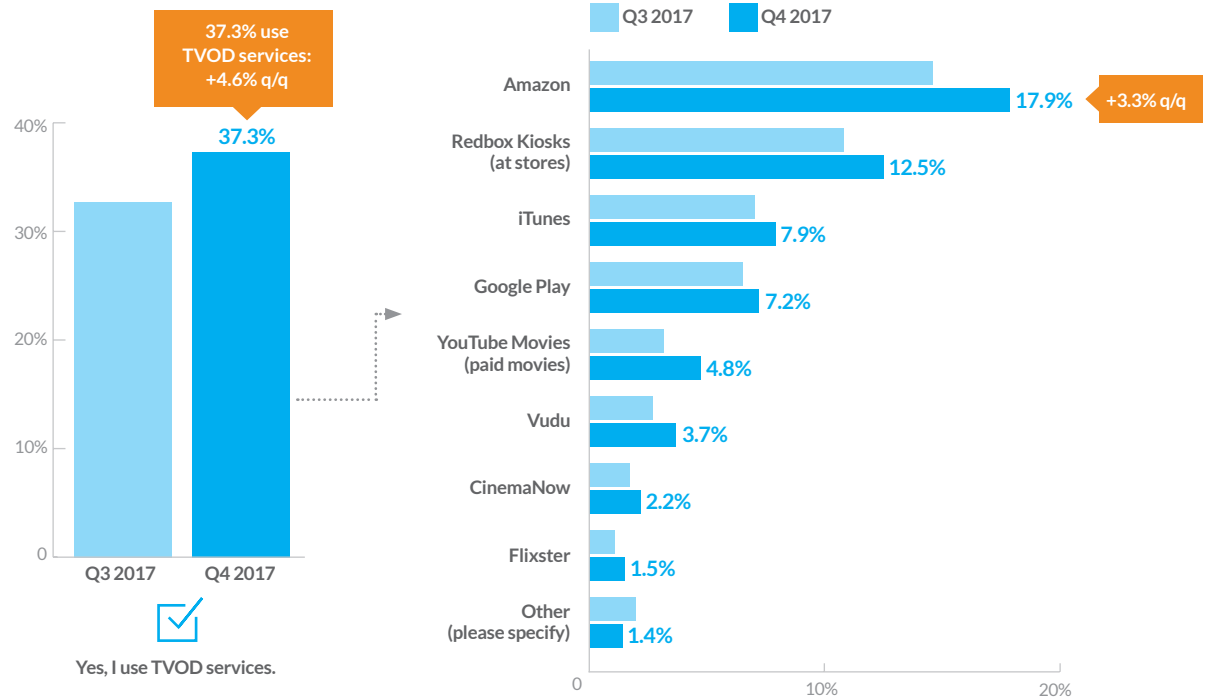


TVOD MARKET SHARE AND ADOPTION

Based on Q4 2017 survey results, TVOD market share, adoption results and trends include:

- 37.3% of all respondents purchase from pay-per-rental or TVOD services, an increase of 4.6 percentage points q/q.
- 38.5% of respondents with pay-TV service are cord-cheaters (those who have pay-TV service and also use a TVOD service), an increase of 5.8 percentage points q/q.
 - 34.3% of cord-cheaters use both TVOD and SVOD services in addition to their cable/satellite service, a category that increased 5.2 percentage points q/q.
- The top three TVOD services are:
 - Amazon—17.9%
 - Redbox Kiosks (at stores)—12.5%
 - iTunes—7.9%
- All TVOD services experienced slight positive growth over Q3 2017 survey results, but only Amazon saw notable growth at 3.3 percentage points q/q.

Do you rent or purchase movies from services like Amazon, CinemaNow, iTunes, Redbox kiosks, Vudu, etc.? (Choose all that apply)



OTT Trends: SVOD and TVOD

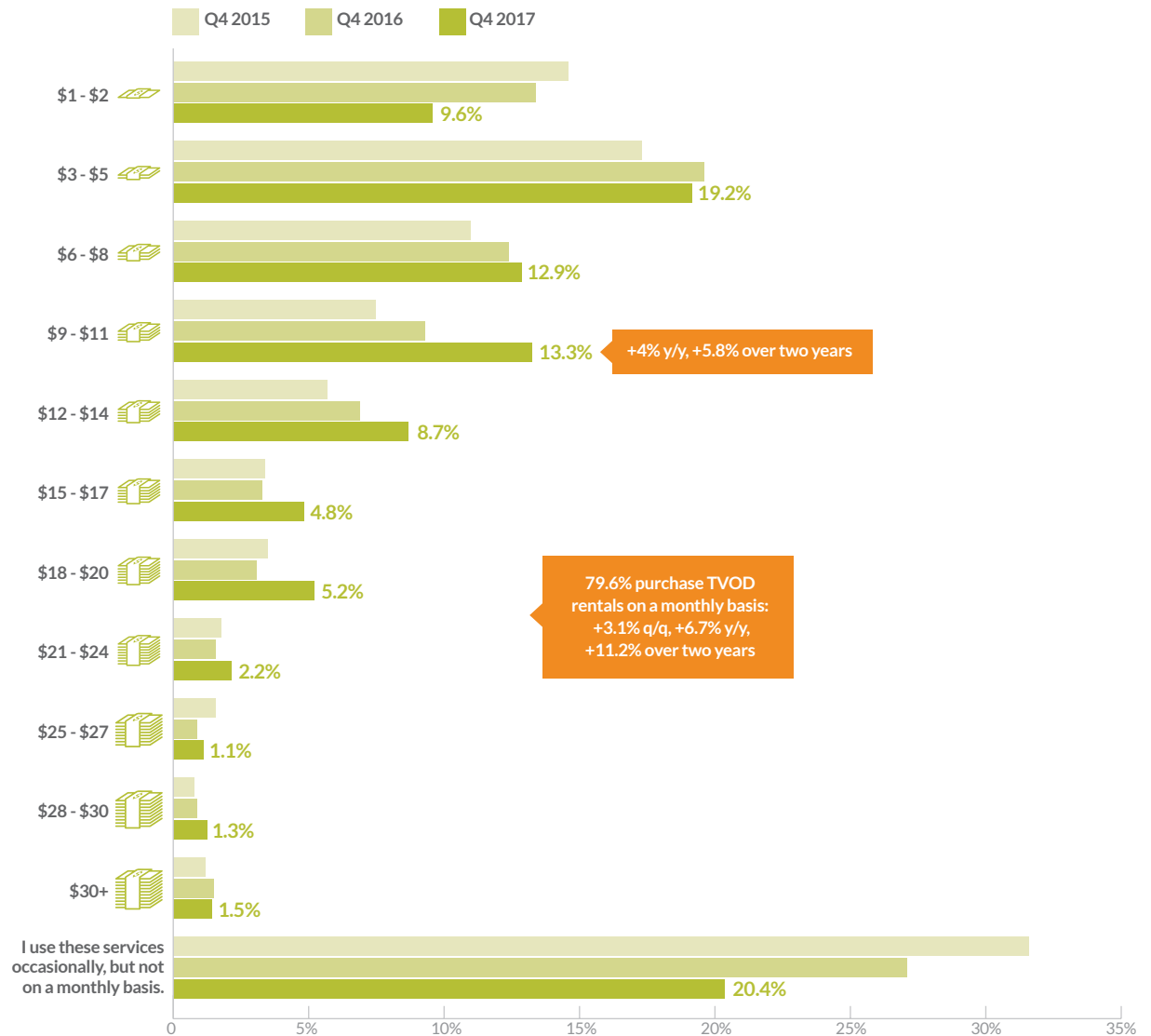


TVOD ENGAGEMENT

TVOD providers will be pleased to know that overall adoption increased q/q and engagement numbers look promising as well. Of those who use TVOD services, engagement is as follows:

- 79.6% spend money on a TVOD rental each month, an increase of 3.1 percentage points q/q, 6.7 points y/y and 11.2 points over two years.
 - The largest group (32.1%) spends \$3 to \$8 monthly.
 - The second-largest group (13.3%) spends \$9 to \$11 per month, and this group increased slightly q/q, 4 percentage points y/y and 5.8 points over two years.

How much do you spend per month renting movies from these pay-per-rental services?



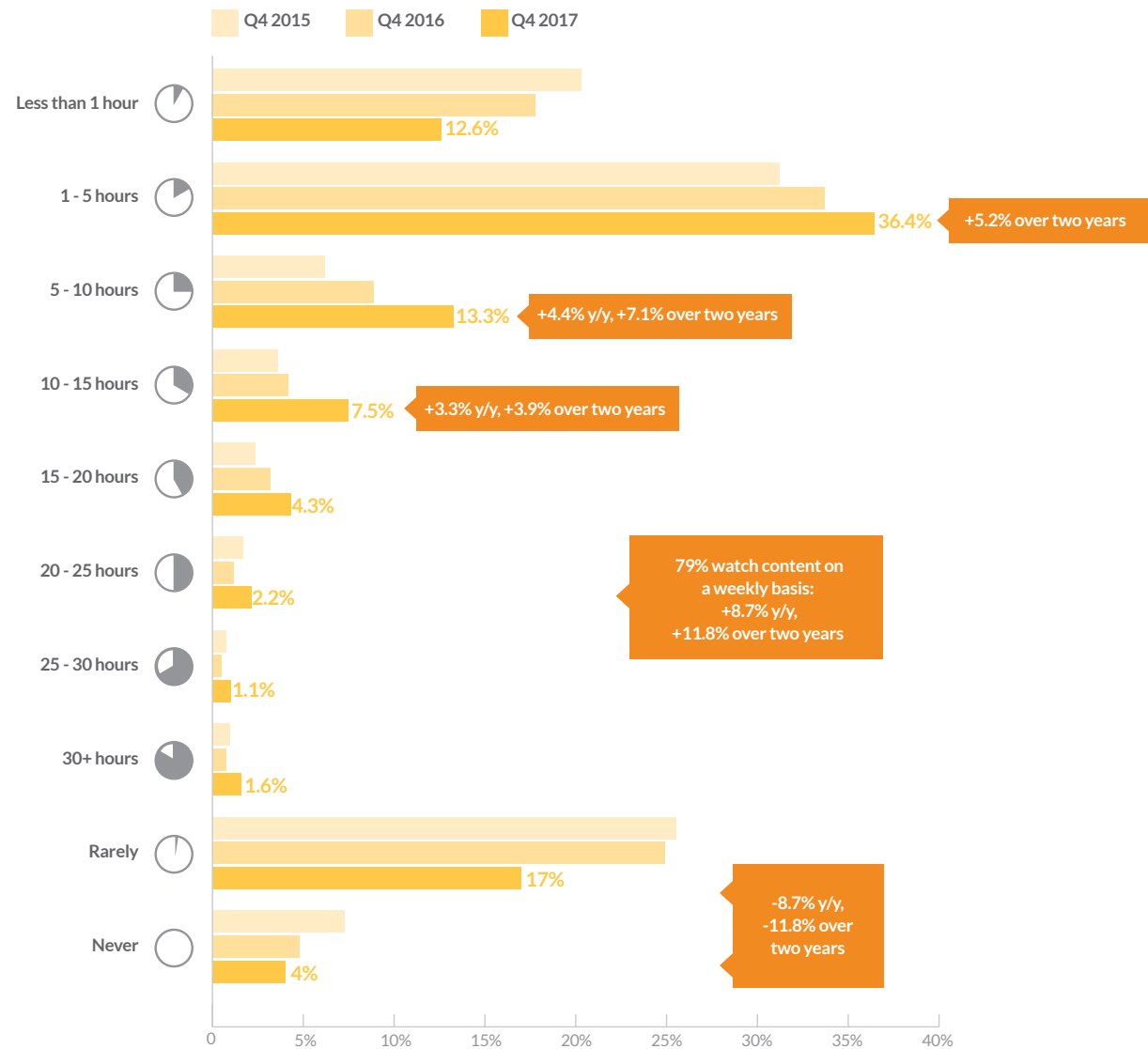
OTT Trends: SVOD and TVOD



TVOD ENGAGEMENT (CONTINUED)

- Of the 37.3% of respondents who use TVOD services, 79% watch content on a weekly basis, an increase of 8.7 percentage points y/y and 11.8 points over two years.
 - The largest group (36.4%) of respondents watch 1 to 5 hours each week, and this group increased slightly y/y and 5.2 percentage points over two years.
 - “5-10 hours” increased 4.4 percentage points y/y and 7.1 over two years.
 - “10-15 hours” increased 3.3 percentage points y/y and 3.9 over two years.
 - Those who answered they “rarely” or “never” use TVOD services decreased slightly q/q, 8.7 percentage points y/y and 11.8 points over two years—good news for TVOD service providers!

On average, how many hours per week do you watch content on these pay-per-rental services?



OTT Trends: SVOD and TVOD



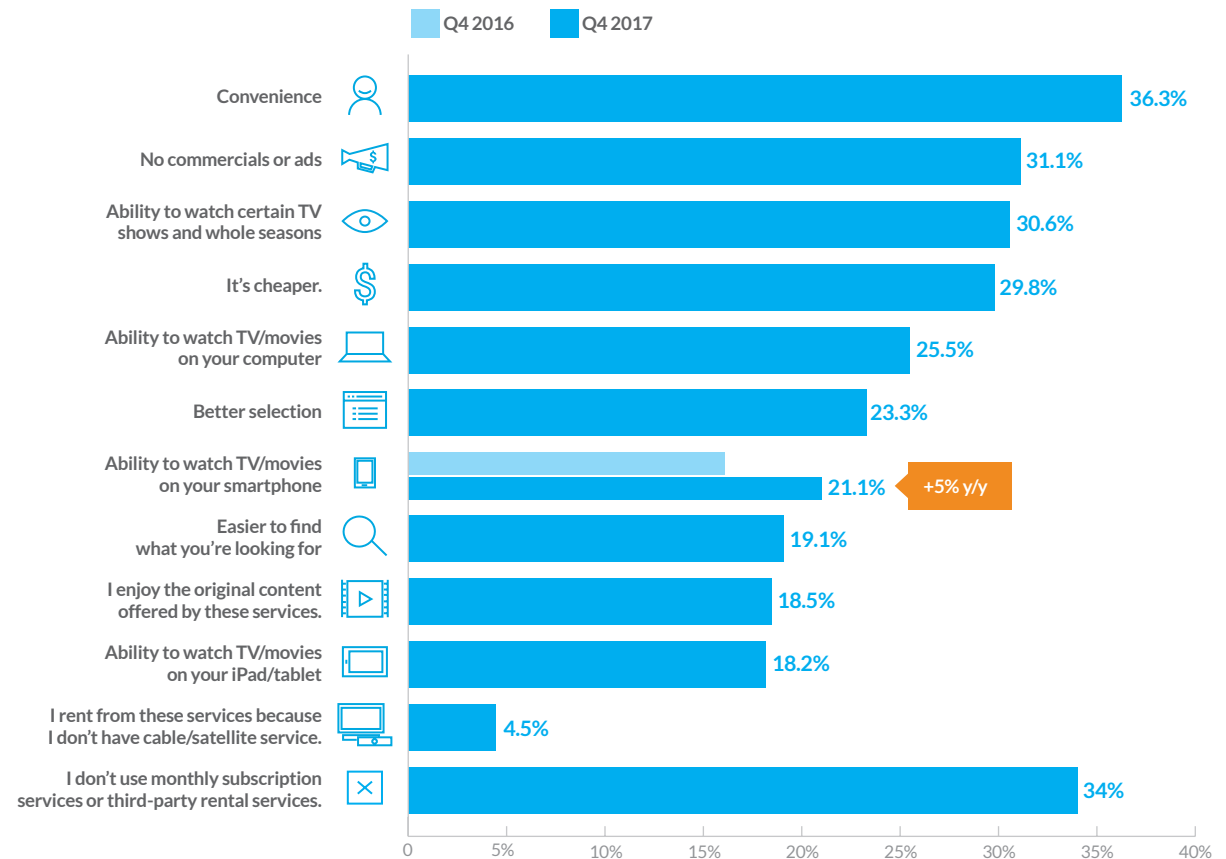
THE ENTICEMENT OF OTT SERVICES

For the seventh quarter in a row, the top reasons respondents use both SVOD and/or TVOD services are:

- Convenience—36.3%
- No commercials or ads—31.1%
- Ability to watch certain TV shows and whole seasons—30.6%
- It's cheaper—29.8%

While these categories remained relatively flat in growth, the answer choice “ability to watch TV/ movies on your smartphone” experienced notable growth of 5 percentage points y/y. Still, pay-TV providers should review the main attractions of OTT services—usability, content and price—and adapt their own offerings accordingly.

Why do you use third-party rental and/or monthly subscription services like Amazon, iTunes, Netflix, Vudu, CinemaNow, Blockbuster, Redbox or YouTube? (Choose all that apply)



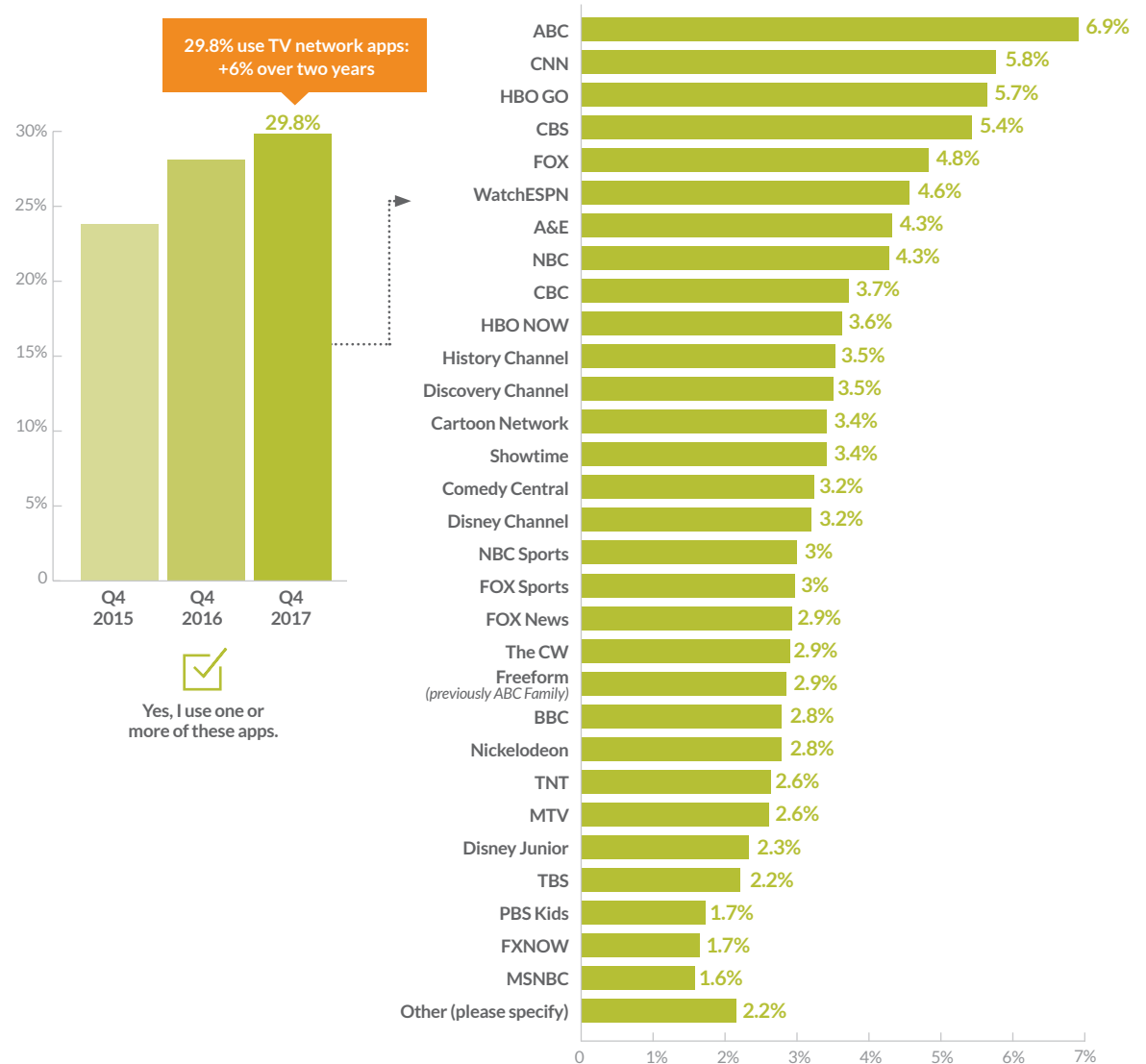
TV Network Apps



ADOPTION

In Q4 2017, 29.8% of respondents use TV network apps, which increased slightly y/y and 6 percentage points over two years. The five most-popular apps are ABC, CNN, HBO GO, CBS and FOX. In last quarter's survey results, WatchESPN tied with FOX as the fifth most-popular TV network app. However, Q4 2017 survey results mark the first time in six quarters that WatchESPN has not made the top five.

Do you have any of the following TV/TV network apps downloaded on your iPad/tablet, smartphone, and/or streaming device? (Choose all that apply)



TV Network Apps

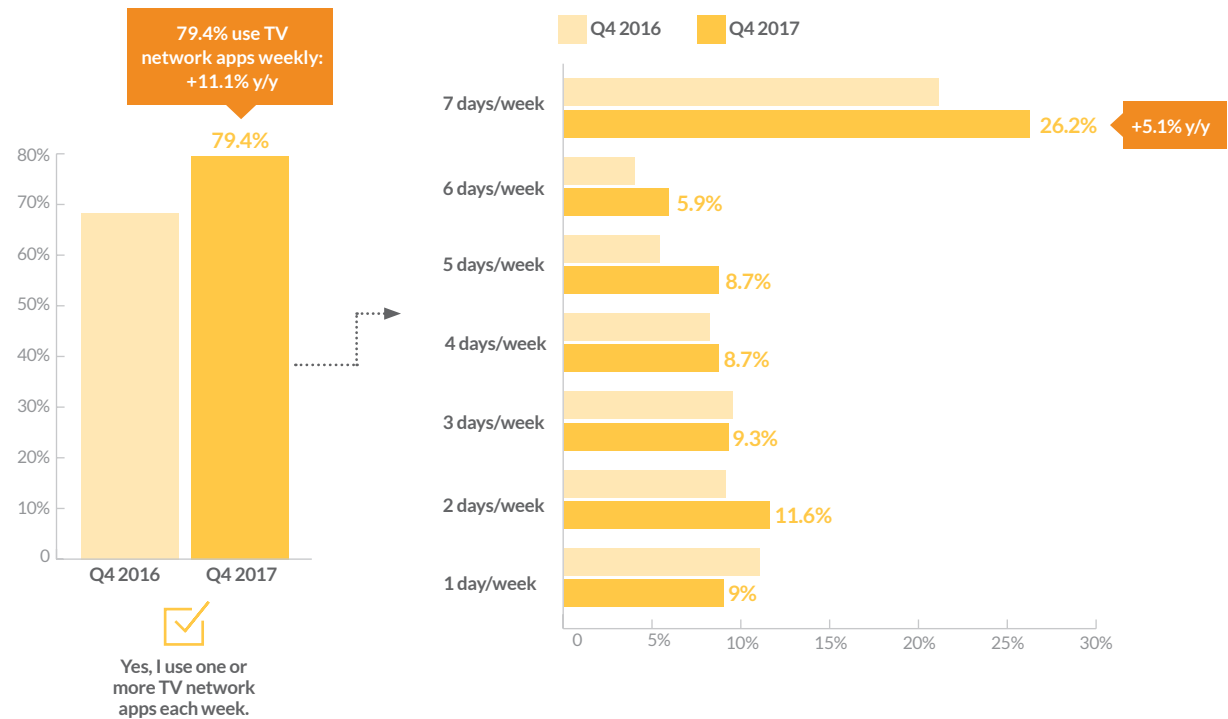


ENGAGEMENT

While TV network app adoption remains positive, engagement with these apps has been on the rise as well, including:

- 79.4% of respondents use at least one TV network apps a week, an 11.1 percentage point increase y/y.
- The largest group (26.2%) use TV network apps daily, and this increased slightly q/q and 5.1 percentage points y/y.
- The second-largest group (20.9%) use TV network apps two to three days a week.

How often do you use these TV/TV network apps?



Connected Devices



STREAMING DEVICES

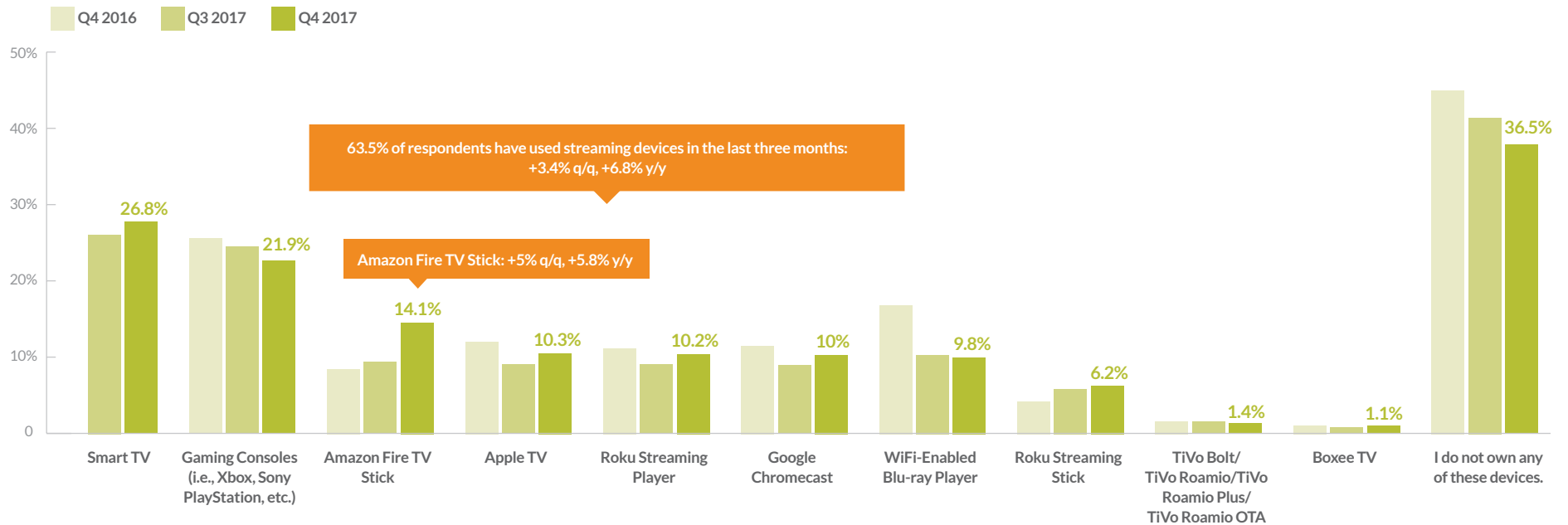
In Q4 2017, 63.5% of respondents have used one or more streaming devices in the last three months, an increase of 3.4 percentage points q/q and 6.8 points y/y. The top three most-used streaming devices are smart TVs (26.8%), gaming consoles (21.9%), and Amazon Fire TV Sticks (14.1%). Not only did streaming devices grow in overall adoption, but several devices also experienced notable trends, including the following:

- Amazon Fire TV Stick was the only streaming device that experienced noteworthy growth, with 5 percentage points q/q and 5.8 points y/y. Does this mean Amazon is winning the streaming device game? While an exact answer to this question can't be given, and other devices might possess a larger

market share, Amazon Fire TV Stick is the only device with significant growth both q/q and y/y. It will be interesting to see if Amazon ultimately catches up with gaming consoles, which experienced slight negative growth both q/q and y/y.

- WiFi-enabled Blu-Ray players have ranked among the top three most-popular streaming devices every quarter since Q4 2016—that is, until this quarter. In Q4 2017, not only did Amazon Fire TV Stick beat out Blu-Ray players by snagging the third most-popular spot, but Apple TV, Roku Streaming Player, and Google Chromecast all ranked higher as well, pushing Blu-Ray players down to the seventh most-used streaming device.

Have you used any of the following streaming devices to watch TV shows, sports and/or movies in the last three months? (Choose all that apply)



Connected Devices



STREAMING DEVICES (CONTINUED)

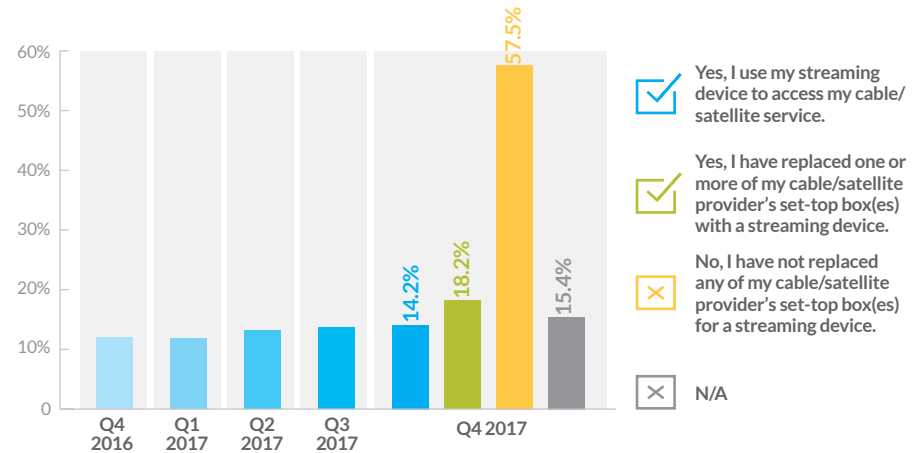
Of respondents who own streaming devices, 14.2% use them to access their pay-TV service, and 18.2% have replaced one or more of their pay-TV provider's set-top box(es) with a streaming device. While no significant growth has occurred among those accessing their pay-TV service through a streaming device, Q4 2017 survey results show the highest level of integration between streaming devices and pay-TV service since being added to the survey in Q4 2016.

For streaming device manufacturers, it's important to understand why consumers aren't buying these devices despite the hype. The top reasons for not doing so are:

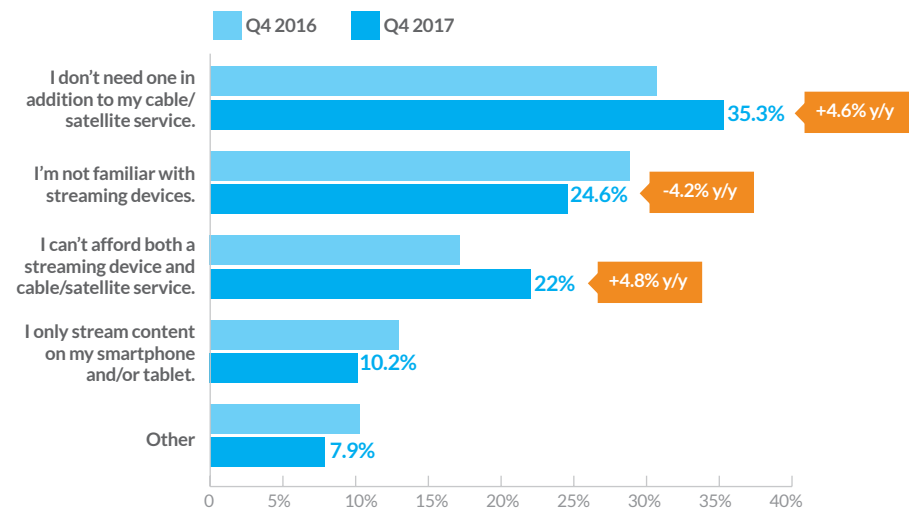
1. "I don't need one in addition to my cable/satellite service." – 35.3%. This category increased 4.6 percentage points y/y, and Q4 2017 marks the highest this answer choice has been since Q4 2016.
2. "I'm not familiar with streaming devices." – 24.6%. Q4 2017 survey results show a decrease of 4.2 percentage points y/y in those who aren't familiar with these devices, which is good news for streaming device manufacturers, and illustrates awareness is trending upward.
3. "I can't afford both a streaming device and cable/satellite service." – 22%. This category increased 4.8 percentage points y/y.

As overall awareness of streaming devices trends upwards, work still must be done on the marketing front to demonstrate why these devices are worth spending the extra money in addition to pay-TV service. In order to convince those already paying for cable/satellite service, must-have functionality should be emphasized.

If YES, have you replaced any set-top boxes in your home with a streaming device, and if so, do you use it to access your cable/satellite service? (Choose all that apply)



Why haven't you purchased a streaming device?



Connected Devices

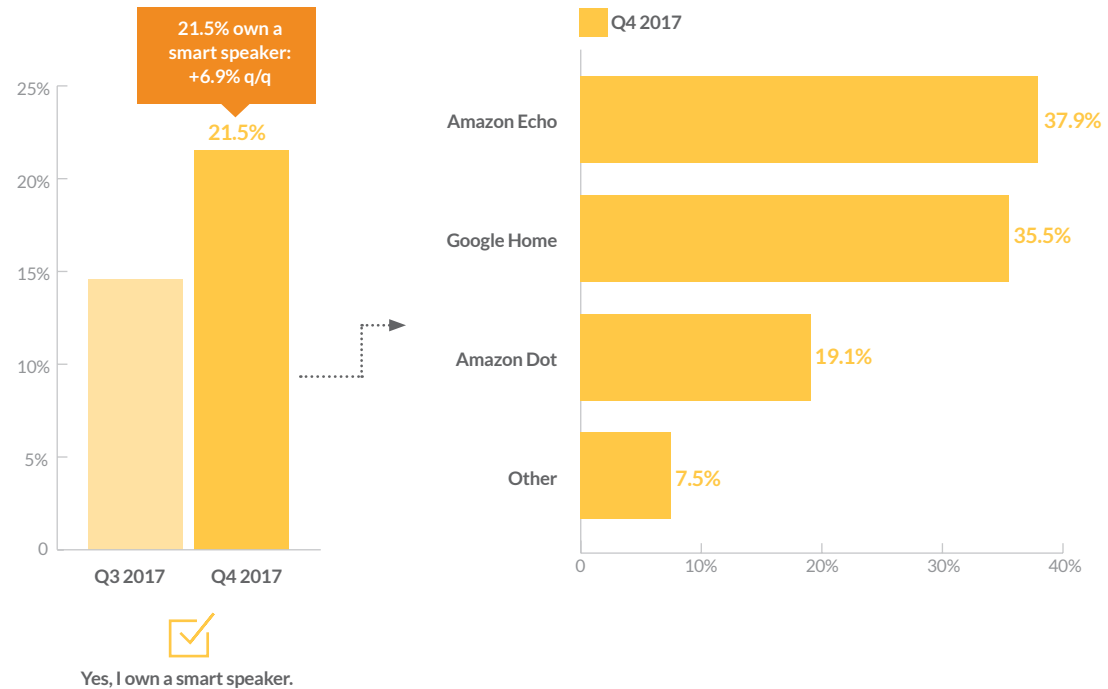
SMART SPEAKERS

In Q4 2017, 21.5% of respondents own a smart speaker, an increase of 6.9 percentage points q/q. In this quarter, Amazon Echo is the most-owned smart speaker device, followed closely by Google Home.

When the percentage of respondents using Amazon's Echo and Dot are combined, the two devices currently hold nearly 57% market share, whereas Google Home is at 35.5% market share. Based on their different marketing strategies, it could be difficult for Google to catch up to Amazon in 2018, but TiVo will continue to monitor the smart speaker industry to see if the gap decreases. Amazon promotes its smart speakers on its homepage, giving them millions of views per day. Meanwhile, Google has yet to do the same, giving Amazon an advantage.

In Q1 2018, an interesting twist occurred: Apple announced its new smart speaker, HomePod², is ready to order. Similar to Amazon, Apple has multiple websites and channels with millions of viewers where it can promote its new device. It will be interesting to track the growth of HomePod, and whether it can compete with Amazon's and Google's devices.

Which of the following smart speakers do you own? (Choose all that apply)



² Apple Inc, "[HomePod arrives February 9, available to order this Friday](#)," Apple Newsroom, January 23, 2018

Connected Devices



SMART SPEAKERS (CONTINUED)

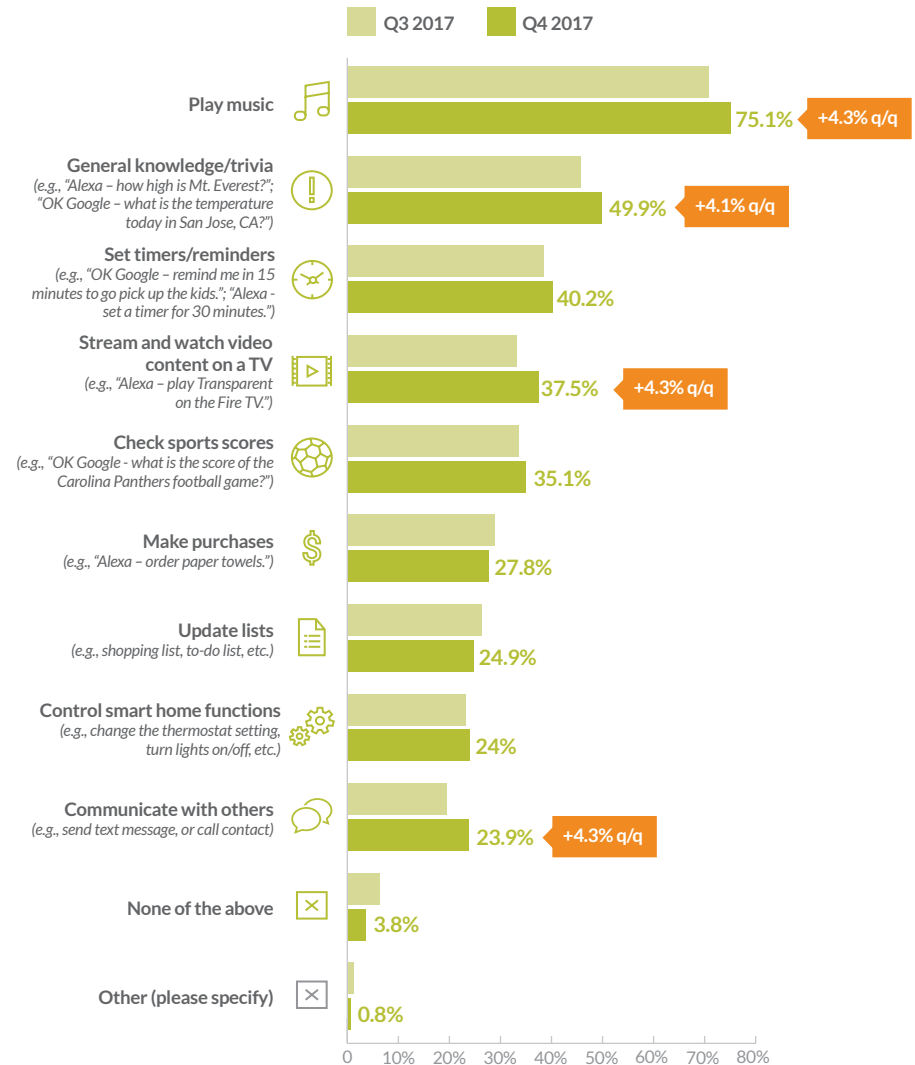
As smart speakers become more and more integrated within consumers' homes, TiVo wanted to track exactly how respondents incorporate these devices into their everyday tasks. The top three uses of smart speakers are:

1. "Play music"—75.1%, with an increase of 4.3 percentage points q/q.
2. "General knowledge/trivia" (e.g., "Alexa - how high is Mt Everest?"; "OK Google - what is the temperature today in San Jose, CA?") —49.9%, with an increase of 4.1 percentage points q/q.
3. "Set timers/reminders" (e.g., "OK Google—remind me in 15 minutes to go pick up the kids.," "Alexa—set a timer for 30 minutes.") —40.2%.

Interestingly, the fourth most-popular usage of smart speakers is to stream and watch video content on a TV (e.g., "Alexa—play Transparent on the Fire TV."), and this usage increased 4.3 percentage points q/q. This further illustrates these devices are becoming more integrated with the way viewers find something to watch on TV. Though TiVo will continue to monitor this trend, it appears that video providers' marketing efforts, particularly those showing how to use these devices with video, are paying off and resonating with respondents.

Consistent with last quarter's results, the living room and bedroom are the two most popular locations for smart speakers (see chart on page 30). The living room increased in popularity by 3.1 percentage points q/q and the bedroom increased 5 percentage points q/q, while the kitchen decreased in popularity by 4.8 percentage points q/q.

Do you use your smart speaker for any of the following activities? (Choose all that apply)



Connected Devices

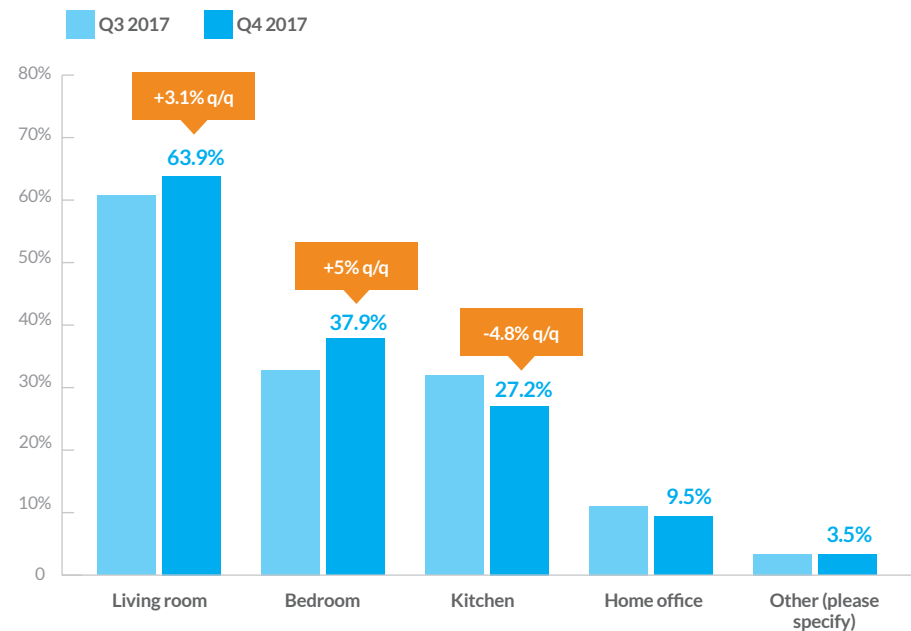


SMART SPEAKERS (CONTINUED)

While smart speaker manufacturers haven't yet focused on a seamless integration and experience of live TV into their product, TiVo is confident this functionality will be released eventually. If pay-TV providers want to win this battle for the living room, they must accelerate the development of voice-enabled video discovery functionality. The need to accelerate these efforts is necessary for numerous reasons: first, do the pay-TV providers want to expose viewer-generated search data to the smart speaker manufacturers? In this scenario, the manufacturers would then have real viewer data, which would inform them what type of video content is searched the most, and allow them to add this content to their catalog. Smart speaker manufacturers could also use the data to deliver more personalized recommendations of content to each household, a move that could potentially make their product more desirable to consumers and more competitive to pay-TV providers. Second, when consumers conduct video searches, smart speaker manufacturers could easily return items from their own catalogs and offerings rather than the viewer's pay-TV provider's content. Essentially, this all comes down to the fact that pay-TV providers want customers to use their own platforms to find content, rather than turning to a smart speaker. To make this reality, pay-TV providers must invest in voice search and discovery to stay ahead of the game.

TiVo believes the living room of the future, complete with a smart speaker, will likely include multiple voice platforms working together to meet viewers' needs. Because Google and Amazon both hold a wealth of historical search and purchasing data, and have a head start on skills and other apps, these companies are at a significant advantage in non-entertainment domains. Pay-TV providers cannot assume they will regain control over the living room across all domains. Instead, they should focus on what makes them succeed: video discovery. If Google and Amazon power voice discovery for tasks like telling the weather, ordering food or turning off lights, it leaves room for pay-TV providers to dominate the media discovery experience.

Where is the smart speaker(s) located in your house? (Choose all that apply)



At the end of the day, ownership of the primary viewer experience is at risk, and the battle for who owns the viewer in the living room is in full swing. TiVo believes this battle will likely be settled within the next 12-18 months—and the providers who do not lay claim to the voice-enabled video experience before then risk losing their connection with the viewer, and their presence in the living room.

Content Discovery: Recommendations, Search and Sports Discovery



In Q4 2017, 12.5% of respondents are “always” frustrated with their ability to find something to watch on their pay-TV service—and 52.1% are “sometimes” frustrated. Despite these results, the following two findings are positive for pay-TV providers:

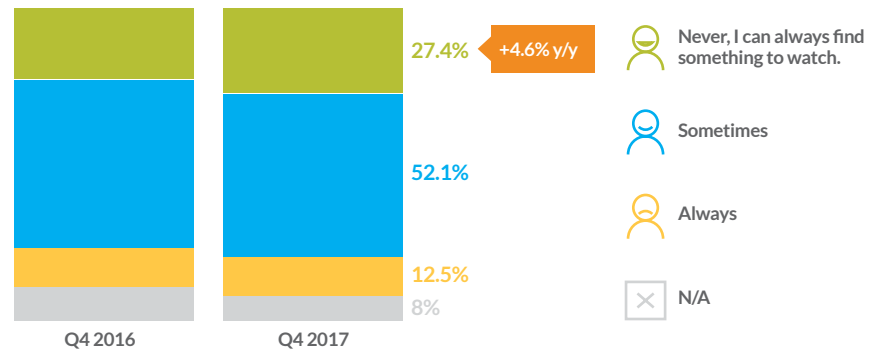
- Those who can always find something to watch (27.4%) increased 4.6 percentage points y/y.
- Those who are always frustrated grew very little, both q/q and y/y.

Starting with content discovery, here is a breakdown of the Q4 2017 survey results for the two main video services covered in the survey.

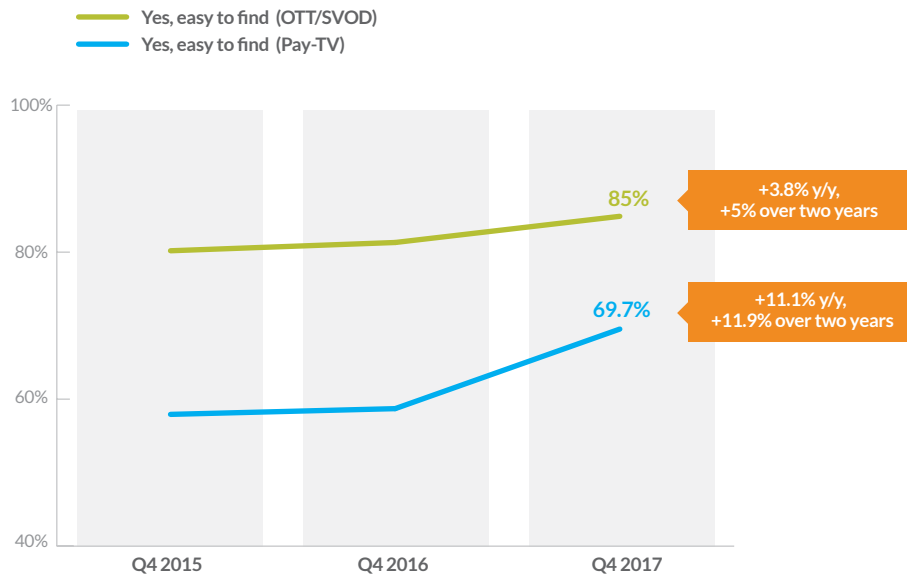
- **Pay-TV Service Content Discovery:** 69.7% of respondents feel it is easy to find something to watch through their pay-TV service, and these overall satisfaction levels with finding something to watch increased 11.1 percentage points y/y and 11.9 over two years.
- **SVOD Content Discovery:** 85% of respondents are pleased with their ability to find something to watch on their SVOD service, an increase of 3.8 percentage points y/y and 5 points over two years.

The Q4 2017 results show a 15.3 percentage point difference in satisfaction between the two service types, favoring SVOD services over pay-TV offerings. However, this favorability toward content discovery on SVOD services has been nearly flat q/q (compare with a 15.2 percentage point difference in Q3 2017). While it would be preferable to see this gap narrowing each quarter, no growth is better than the alternative, and it will take time to close the gap as pay-TV user interfaces slowly receive updates across most North American providers.

How often do you get frustrated when trying to find something to watch on TV?



Do you feel it is easy to find something you “want” to watch on TV?



Content Discovery: Recommendations, Search and Sports Discovery

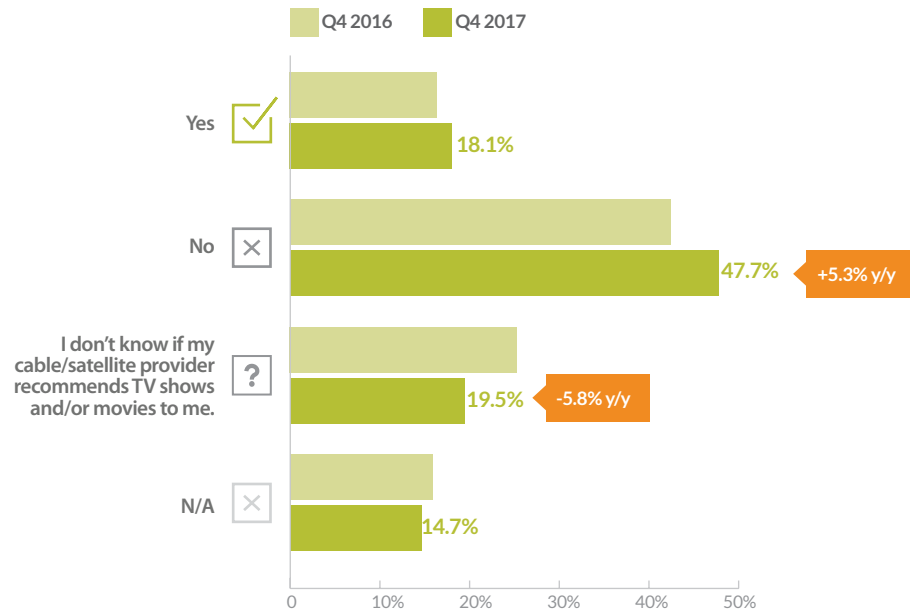


RECOMMENDATIONS

In Q4 2017, 18.1% of respondents reported receiving TV, movie and/or sports recommendations as part of their pay-TV service. According to Q4 2017 results, it appears the awareness of content recommendations has increased with a 5.8 percentage point decline y/y in those who answered, “I don’t know if my cable/satellite provider recommends TV shows, movies and/or sports to me.” Despite the increased awareness, this quarter, 5.3% more respondents indicated that content recommendations are not offered at all.

Pay-TV providers should be concerned by the relatively low number of respondents who answered they have personalized content recommendations. Personalization is widely considered to be a critical component to the entertainment experience. Not only does the SVOD competition offer personalized video functionality, but recommendations ranks among Netflix’s top five most-appealing features. Also, when personalization is offered to viewers they watch more content³. Personalization is even more important when voice search functionality is added to a pay-TV provider’s offering. When viewers ask a voice remote, “What’s on TV now?” they are not looking for a channel grid—but rather recommendations based on their individual viewing behavior and preferences.

Does your cable/satellite provider make personalized recommendations of TV shows and movies to you based on your interests, past viewing habits, etc.?



³ Based on results of studies conducted by TiVo's Personalized Content Discovery Team in September 2016 for a period of 14 days.

Content Discovery: Recommendations, Search and Sports Discovery

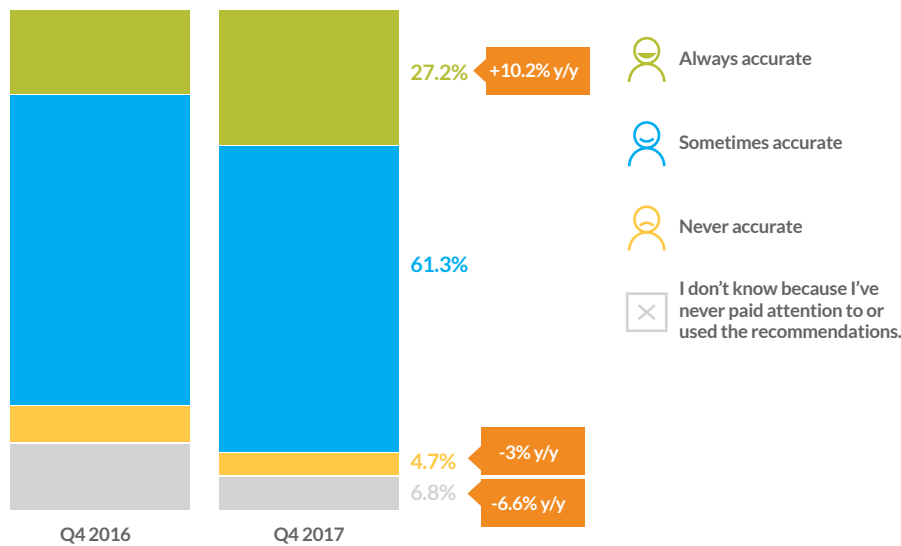
Pay-TV Subscribers With Recommendations

- Almost a third of respondents with recommendations (27.2%) answered the results are “always accurate”—a slight increase q/q and an increase of 10.2 percentage points y/y.
- The number of respondents who answered “never accurate” decreased nearly 3 percentage points y/y.
- Also, of those who have recommendations but are clearly unengaged (they answered, “I don’t know because I have never paid attention to or used the recommendations.”), decreased 6.6 percentage points y/y.

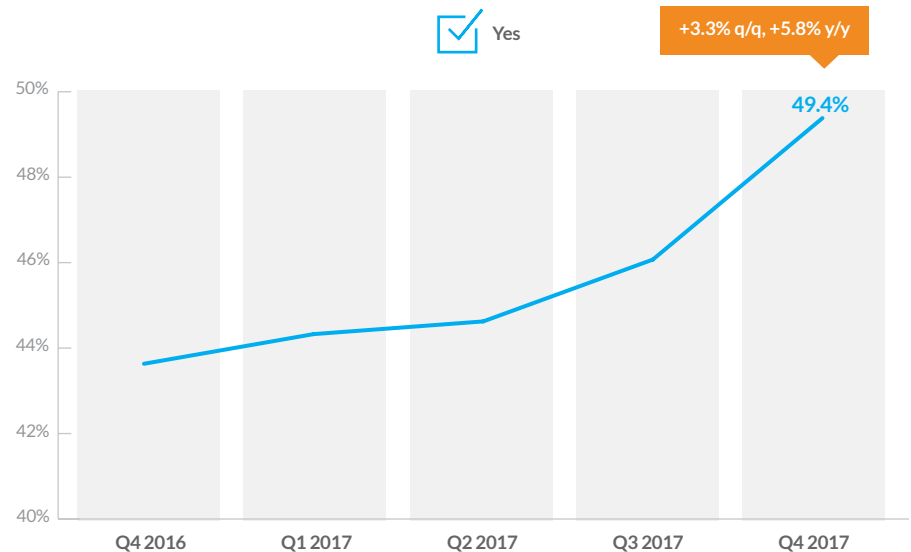
Pay-TV Subscribers Without Recommendations

- Of the 47.7% who responded that their pay-TV provider doesn’t recommend content to them, nearly half (49.4%) would like video recommendations.
- Those who would like recommendations increased 3.3 percentage points q/q and 5.8 points y/y, and Q4 2017 marks the highest this result has been across all 2017 surveys.

Do you feel the recommendations are accurate/relevant?



Would you like to have TV shows and movies recommended to you (and personalized to your liking)?



Content Discovery: Recommendations, Search and Sports Discovery



SEARCH

This report breaks search functionality into four categories: lists or category searches, cross-catalog search, text search and voice search.

List/Category Search

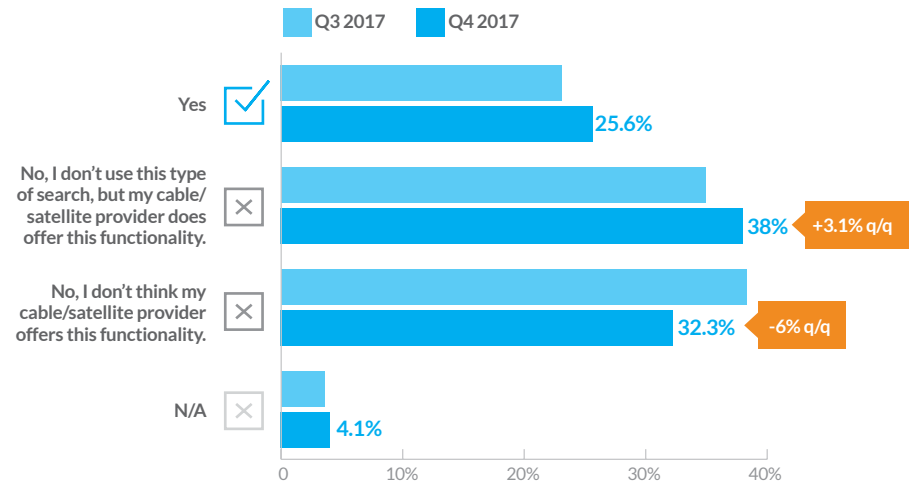
In Q4 2017, 25.6% of respondents use pre-made category lists to search for channels, an activity that increased slightly q/q and y/y. Those who answered, “No, I don’t think my cable/satellite provider offers this functionality” decreased 6 percentage points q/q. Since this functionality is currently offered by most North American pay-TV providers, and has been for quite some time, it’s encouraging to see a decreased awareness gap.

Cross-Catalog Search

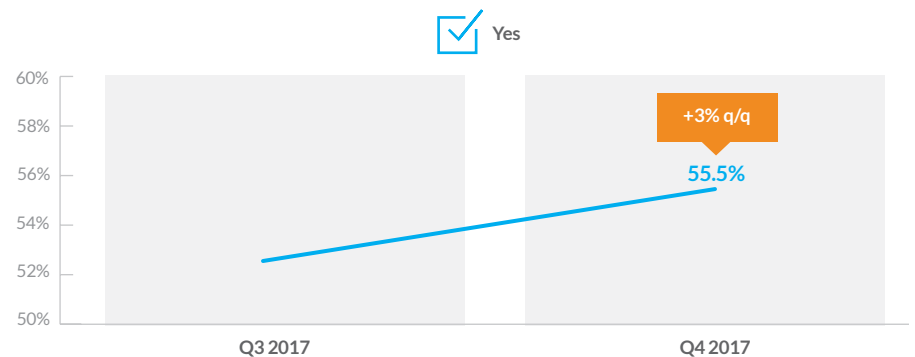
Over half (55.5%) of respondents would like the ability to find something to watch across their TV services (otherwise known as cross-catalog search), such as pay-TV, Netflix, Amazon Prime Video and Hulu. The desire to search multiple video sources increased 3 percentage points q/q, and Q4 2017 marks peak interest for this feature since it was added to the survey in Q1 2017.

As stated in previous reports, the implementation of cross-catalog functionality is a must. Considering high interest alongside the rise of TV apps/streaming services and smart TVs, pay-TV providers may eventually have no choice but to incorporate cross-catalog functionality.

Do you use the pre-made category lists to search for channels such as “Family/Kids’ Shows,” “Sports,” or “Lifestyle Channels”?



Would you like to be able to search for TV shows and movies across all of your TV services? (Cable/satellite, Netflix, Amazon Prime Video, Hulu, etc.)



Content Discovery: Recommendations, Search and Sports Discovery



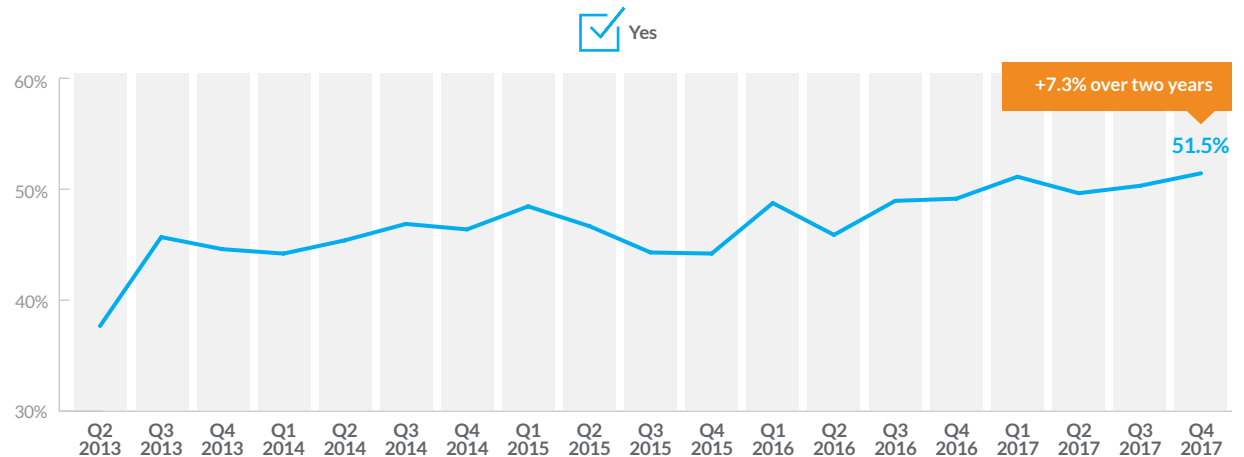
TEXT SEARCH

Just over half (51.5%) of respondents use text search. Usage of text search increased slightly q/q and y/y, and 7.3 percentage points over two years. The Q4 2017 survey marks the highest reported usage of text search since Q2 2013. Of the 51.5% of respondents who use text search to find something to watch on TV, 86.7% feel the results are accurate.

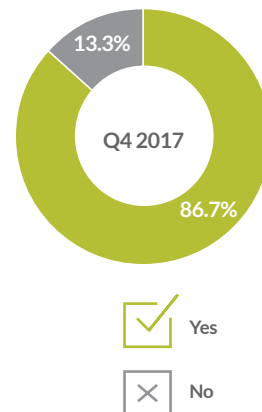
Why aren't nearly half of respondents using this functionality to improve their ability to find something to watch? For the third quarter in a row, the top three reasons respondents don't use the text search functionality offered by their pay-TV provider are as follows:

1. "I only watch a few channels so there's no need to search." —30.8%
 - While this is the top answer choice, it declined 7.7 percentage points y/y.
2. "I am not interested in searching for TV shows/movies." —23.6%
3. "Search is not offered by my cable/satellite provider." —19.6%
 - This category increased 4.3 percentage points y/y. This demonstrates the increasing importance of reminding subscribers about the content discovery functionality available, and the need to continuously build awareness of the many ways in which viewers can find something to watch.

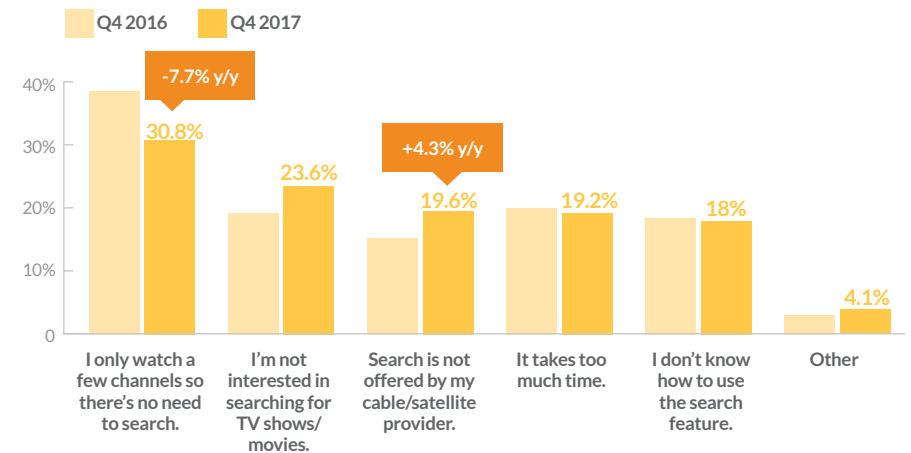
Do you ever type a TV show, movie title or topic into a search box to find something to watch in your cable/satellite guide?



If yes, do you feel the search results are accurate?



If no, why don't you use the search functionality offered to you? (Choose all that apply)



Content Discovery: Recommendations, Search and Sports Discovery



VOICE SEARCH

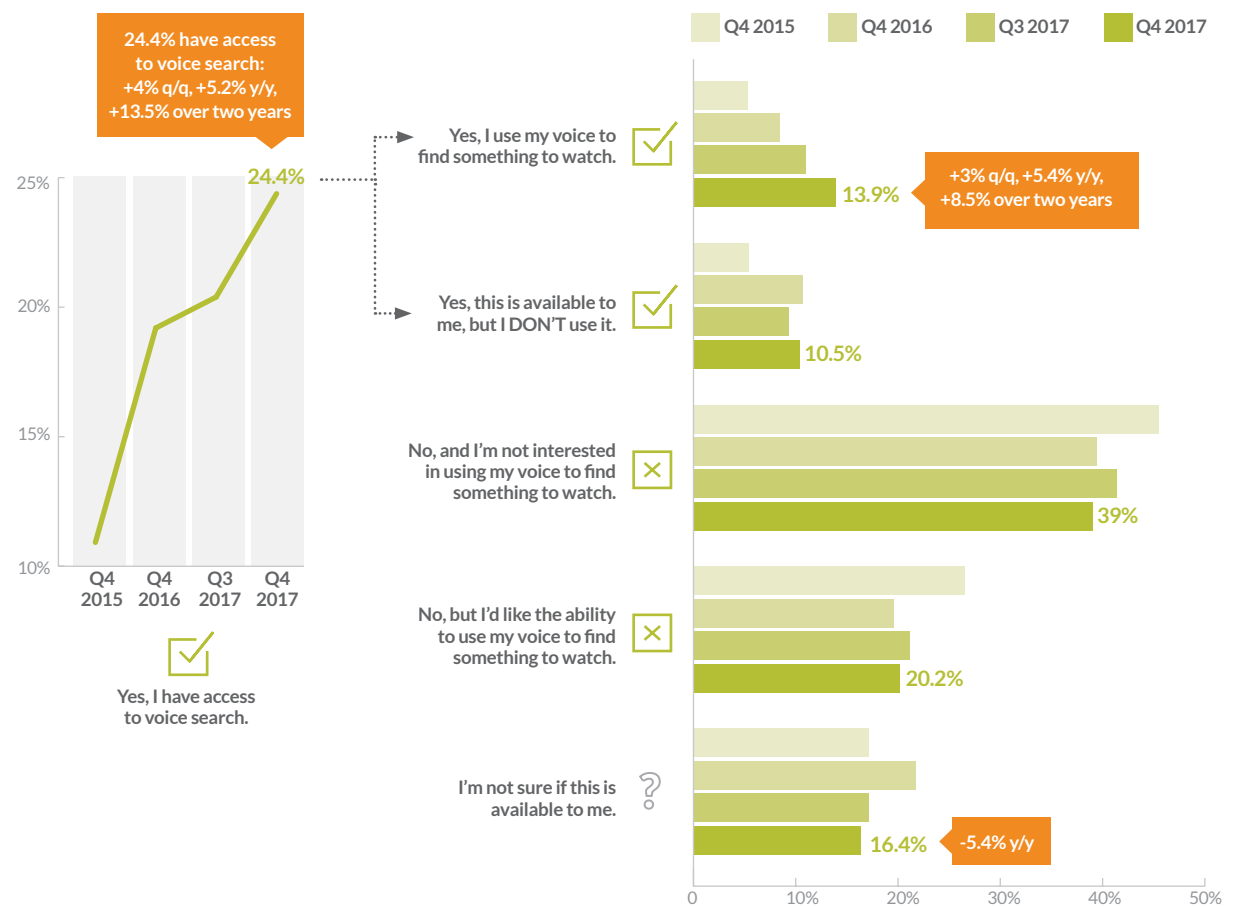
Voice search continues to be a hot topic for video content discovery, as well as with other technologies such as smart speakers. While voice functionality was prevalent in early January at CES 2018, the question remains: are consumers leveraging this technology or is it still foreign to them? In Q4 2017, 24.4% of respondents have the option of using their voice to search content, but of this audience—just over half (13.9%)—answered that they actually do so. However, several positive findings on voice search include:

Awareness: Tracking this metric is important when launching new functionality, and respondents who answered, “I’m not sure if this is available to me,” decreased 5.4 percentage points y/y.

Accessibility: Q4 2017 survey results confirm that pay-TV providers are investing in voice search, with overall accessibility to the functionality increasing by 4 percentage points q/q, 5.2 points y/y and 13.5 points over two years.

- Q4 2017 survey results for those who have the option of using voice search are at their highest since Q4 2015.
- Another 20.2% of respondents don’t have the option to use their voice to find something on TV, but would like the ability to do so.

Do any of your devices for viewing TV and/or movies (e.g., Apple TV, Roku, cable remote, etc.) allow you to talk into the device to search for a TV show/movie, change channels, etc.? (e.g., search by saying, “Is a scary movie on now?”)



Content Discovery: Recommendations, Search and Sports Discovery

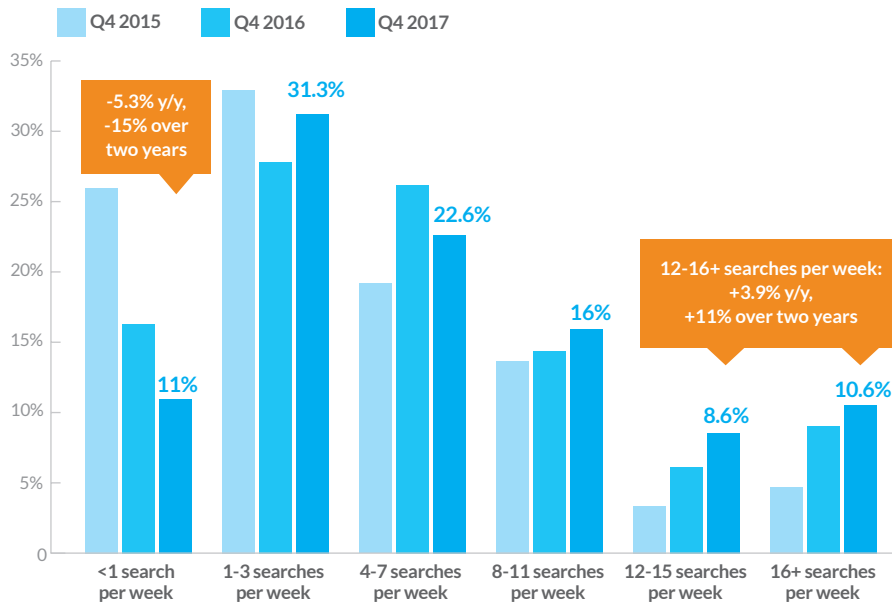


VOICE SEARCH (CONTINUED)

Usage: In addition to increased access to this functionality, voice search usage experienced positive growth of 5.3 points y/y and 15 points over two years.*

- Of respondents using voice search, 89% do so on a weekly basis.
- Most voice search users conduct 1 to 3 searches a week, and the next-largest group conduct 4 to 7 searches a week.
- Overall volume of voice searches conducted each week is trending upwards with increases of 3.9 percentage points y/y and 11 points over two years in the combined categories of 12 to 16+ searches per week.

How often do you use voice search?



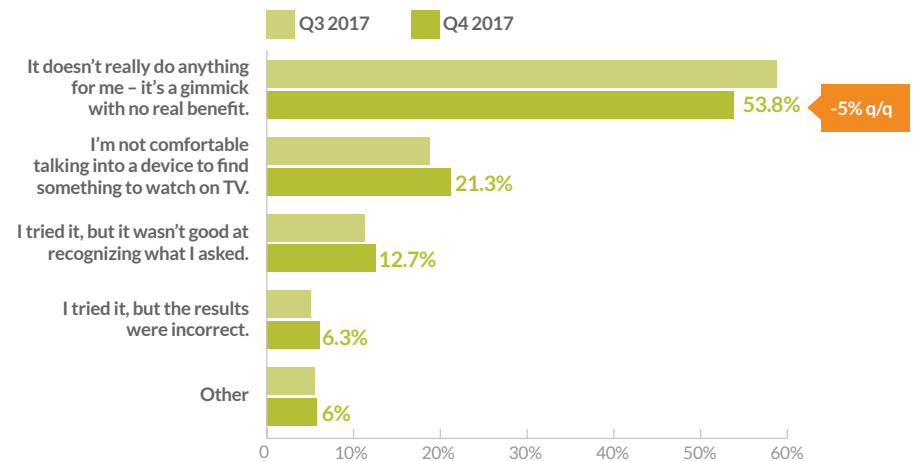
*Note: The average MOE for Voice Search results is 4%.

As voice search gains popularity and becomes a key feature marketed by video providers, TiVo seeks to help pay-TV providers better understand why respondents aren't using this form of content discovery. Respondents don't wish to use their voice to search for the following top reasons:

- "It doesn't really do anything for me – it's a gimmick with no real benefit."— 53.8%, which decreased 5 percentage points q/q.
- "I'm not comfortable talking into a device to find something to watch on TV."— 21.3%
- "I tried it, but it wasn't good at recognizing what I asked."— 12.7%

Despite these hesitations, the number of respondents who do not see a benefit in voice search decreased 5 percentage points q/q. However, those who answered "I'm not comfortable talking into a device to find something to watch on TV" increased slightly q/q. It remains imperative to market clear, exact use cases of how to conduct voice searches in order to boost interest and confidence in the functionality.

Why aren't you interested in using your voice to search for something to watch on TV? (Choose all that apply)





Analytical Commentary

RELATIONSHIP BETWEEN VOICE SEARCH & CONTENT DISCOVERY



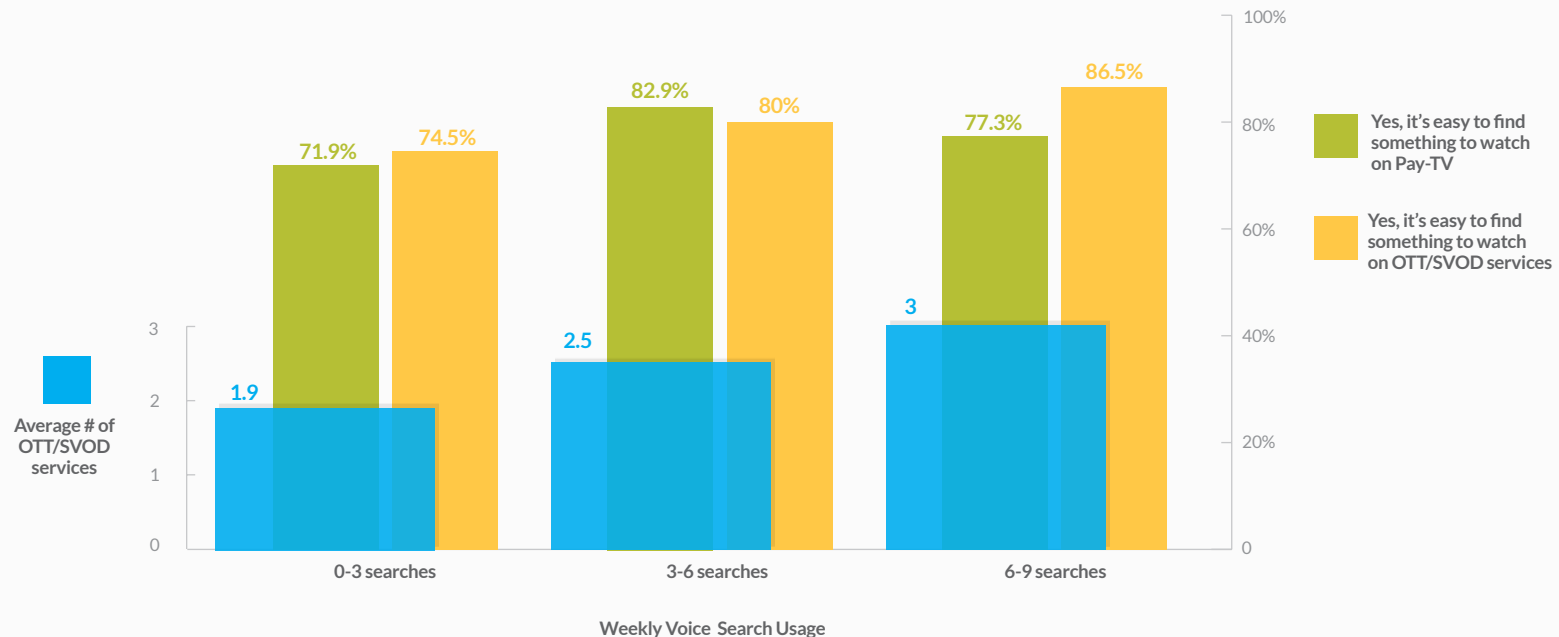
While voice search slowly, but actively, rolls out to pay-TV subscribers, TiVo believes it is the future for video. The relationship between respondents' sentiment toward their ability to find something to watch as well as their usage of voice search is an important viewer engagement metric. The chart below shows weekly voice search usage and how respondents judged their ability to find something to watch on both pay-TV service and OTT/SVOD services.

The results demonstrate that the most engaged voice search users—those who conduct three or more voice searches per week—are happiest with their ability to find something to watch.

Another interesting trend—respondents who conduct nine or more voice searches per week also subscribe to the most OTT services, and these heavy voice search

users are pleased with their ability to find something to watch on an SVOD service at a much higher rate (9.2 percentage points) than on their pay-TV service. One could argue that with more services to surf, the more cumbersome it could be to find something to watch, but this is not the case in our findings. For pay-TV providers, the results may highlight another at-risk audience, if perceived value in cable/satellite service diminishes over time as viewers become happier with their ability to find something to watch on their SVOD service. As consumers upgrade to next-generation streaming devices that offer voice search capabilities, this behavior could accelerate. In response, pay-TV providers must intensify plans to roll out their own voice search features.

VOICE SEARCH USERS AND THEIR ABILITY TO FIND SOMETHING TO WATCH



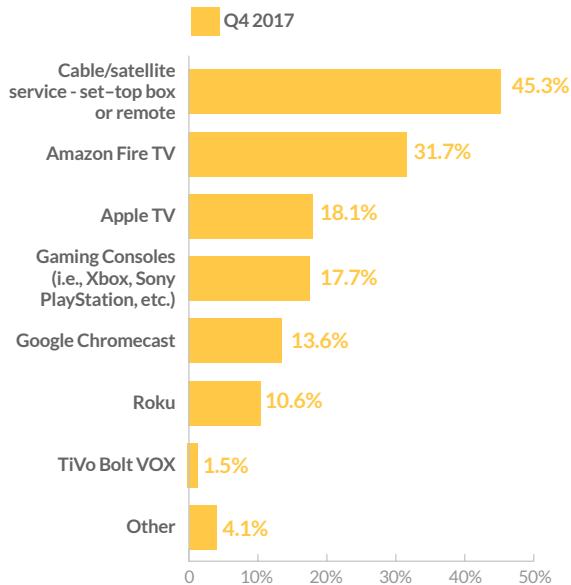
Content Discovery: Recommendations, Search and Sports Discovery



VOICE SEARCH (CONTINUED)

With voice search now ubiquitous across multiple devices including pay-TV remotes, iPad/tablets, smartphones and smart speakers, TiVo wanted to determine on which devices respondents are conducting voice searches. While the question was first asked in Q3 2017, the answer choices changed in Q4 2017 to include more options. See the chart below for the top devices used for voice.

Which device(s) do you speak into in order to search for something to watch on TV? (Choose all that apply)



Analytical Commentary

VOICE SEARCH VOLUME ON TOP STREAMING DEVICES

As voice functionality continues to evolve, more and more devices are hitting the market with this capability, and many streaming device manufacturers are integrating voice search into their products. In order to keep up with this rapidly expanding trend, TiVo has started to track voice usage by device. Based on respondents' answers, the chart to the right shows the average number of voice searches being conducted on the top voice-enabled devices. Apple TV and TiVo BOLT VOX™ users are most engaged, using the voice functionality more often than users of other devices. Because older generations of streaming devices without voice search are still in use, TiVo believes these numbers will grow dramatically as consumers upgrade to new voice-enabled streaming devices.

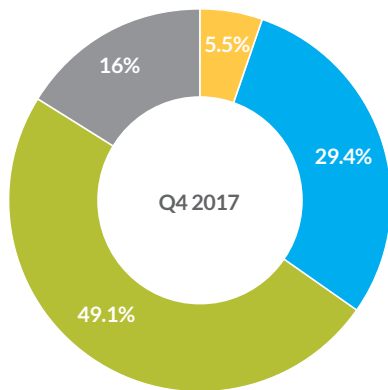
VOICE-ENABLED DEVICES	AVERAGE VOICE SEARCHES PER WEEK
Amazon Fire TV	6.5
Cable/satellite service – set-top box or remote	6.8
Roku	6.9
Google Chromecast	7.3
Gaming Consoles (i.e., Xbox, Sony PlayStation, etc.)	7.4
Apple TV	7.6
TiVo BOLT VOX	8.6

Sports Discovery



Of all respondents, 5.5% are “always” frustrated when trying to find their favorite sporting event or team, and 29.4% are “sometimes” frustrated. While this frustration hasn’t grown dramatically q/q or y/y, these two groups combine to make up more than a third of respondents, indicating that providers should prioritize better discovery of this content.

Do you have trouble finding your favorite sports teams’ games or do you ever miss sporting events because they’re on a channel that is far down in your channel guide?

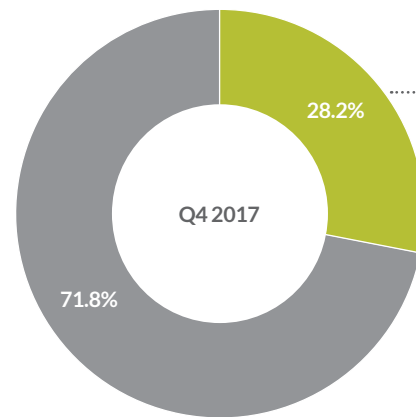


- Always have trouble
- Sometimes have trouble
- Never have trouble
- N/A

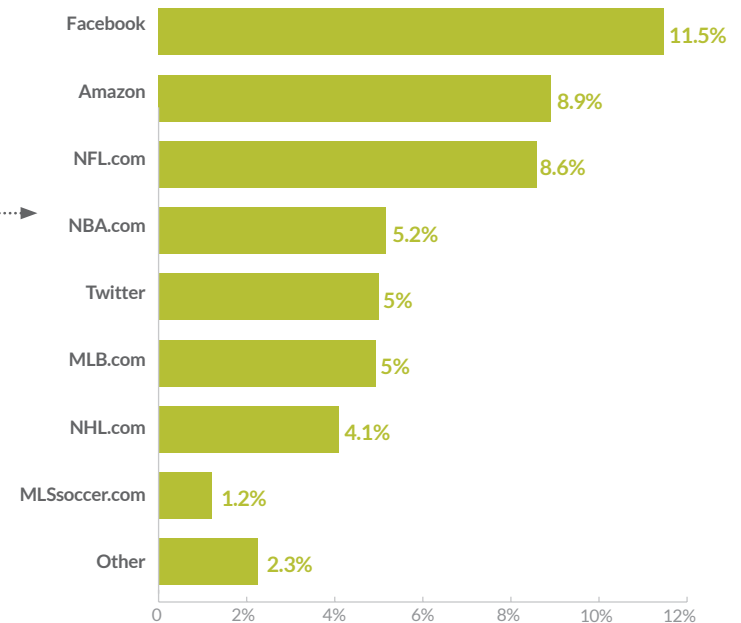
IS OTT STEALING VIEWERSHIP FROM PAY-TV AND BROADCAST NETWORKS’ SPORTS PROGRAMMING?

In 2017, the video industry experienced a major shift in how consumers watch sporting events. As the year progressed, it became increasingly popular to stream sports from social media sites, such as Facebook and Twitter; content distributors like Amazon; and even directly from sports leagues (i.e., NBA, NFL), drawing thousands—and in some cases millions—of viewers.

Have you ever streamed sporting events/games on a streaming or mobile device from any of the following websites? (Choose all that apply)



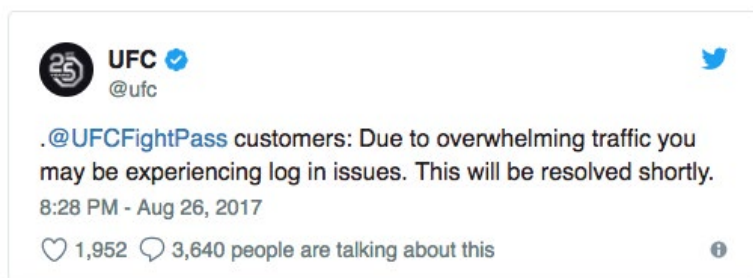
- Yes, I've streamed sporting events/games from one or more of these websites.
- No, I don't watch any sporting events/games on any of these websites.



IS OTT STEALING VIEWERSHIP FROM PAY-TV AND BROADCAST NETWORKS' SPORTS PROGRAMMING? (CONTINUED)

According to TiVo's Q4 2017 survey results, 28.2% of all respondents have streamed a sporting event from the websites in the chart on page 40. According to respondents, the most popular sites for streaming sports in Q4 2017 are Facebook, Amazon and NFL.com. Because 2017 resulted in such a dramatic shift, TiVo wanted to highlight a few noteworthy events:

1. In August 2017, ultimate fighting experimented with the streaming trend for the boxing match between Floyd Mayweather and Conor McGregor. Not only was it available from pay-per-view, viewers could also purchase and stream the fight directly from Showtime and the UFC's website. In a monumental shift, this decision became one of the first big-name fights to break away from the traditional pay-TV model, in which customers order a one-time fight for around \$99 from their cable/satellite provider. While TiVo doesn't have exact viewership data, according to several sources enough people purchased the fight directly from Showtime or the UFC's website that many experienced minor technical delays.⁴



2. The NFL is one of the most popular North American sports leagues, and in the 2017/18 season, there were more NFL viewing options than ever before. While pay-TV experienced a decline in NFL viewership, streaming of these games grew dramatically. Amazon paid a reported \$50 million for the rights to stream the NFL's Thursday night games, and nearly two million people tuned in for the first game it streamed.⁵

3. Reports suggest Facebook plans to spend billions⁶ on the rights to stream live sporting events, and the company has recently hired the CEO of Eurosport, Peter Hutton, to spearhead these efforts⁷. Facebook's strategy appears to extend beyond North American sports, as they recently bid \$600 million for the rights to stream Indian cricket games, but lost to another company⁸. Still, these actions prove that the social media company is serious about making a play in the broadcasting of sports content.

What does sports streaming mean for pay-TV providers and broadcast networks? This new trend should cause great concern. Major TV networks have historically paid, and continue to pay, millions—and in some cases, more—for the broadcast rights to sporting events. For many years, pay-TV providers counted on these rights to guarantee them both a competitive advantage and a dedicated customer base. As more viewers transition to streaming, the investments of broadcast networks are jeopardized since lower viewership could impact advertising revenue generated during sporting events. Additionally, most concerning for pay-TV providers, the low cost for viewers to stream sports could prompt customers to cut cable/satellite altogether.

4 Adam Stites, "[Mayweather-McGregor broke PPV and live streams, just like Mayweather-Pacquiao](#)," SBNation, August 26, 2017

5 Reuters, "[Nearly 2 million people streamed Thursday Night Football on Amazon](#)," NY Post, September 30, 2017

6 Ben Munson, "[Facebook earmarks a 'few billion dollars' for streaming sports rights](#)," FierceCable, December 5, 2017

7 Todd Spangler, "[Facebook Recruits Eurosport Chief Peter Hutton to Lead Global Sports-Rights Deals](#)," Variety, January 21, 2018

8 Peter Kafka, "[Facebook just bid \\$600 million to stream Indian cricket matches. Will it try NFL games next?](#)," Recode, September 4, 2017



Analytical Commentary

ARE SMART SPEAKERS A GATEWAY TO STREAMING SPORTS?



With online providers shelling out big bucks for the rights to stream sports, TiVo thought it would be interesting to track both the most popular sports streaming options as well as the demographic categories viewing them.

The more time a respondent spends watching sports, the more their behavior—particularly discovery frustration—is affected in other areas, such as online sports streaming and voice search usage. For example, respondents who watch sports four hours or more a day are more likely than those who watch zero to two hours a day to do the following:

- 77.9% more likely to select “always” frustrated when trying to find sports content.
- 111.9% more likely to watch sports via online streaming.
- 191.1% more likely to check sports scores on a smart speaker.

Additionally, respondents who watch sports two to four hours a day are more likely than those who watch zero to two hours a day to do the following:

- 96.2% more likely to watch sports via online streaming.
- 148.2% more likely to check sports scores on a smart speaker.

What does this mean for the once-stagnant, but now rapidly-changing, sports content landscape? For one, broadcast networks should be concerned that the data smart speaker manufacturers can now gather from people checking sports scores. For example, if an Amazon Echo device is asked for the score of the New England Patriots game, Amazon now knows that this household is likely interested in not just football, but the New England Patriots specifically. With this insight, it would make sense for targeted ads promoting Amazon’s Thursday Night Football stream to be delivered to this household. What effect will advanced targeting like this have on pay-TV providers, and will it be yet another threat to their subscriber base?

DAILY SPORTS VIEWING TIME	FRUSTRATION TRYING TO FIND SPORTS TEAMS/SPORTING EVENTS				AGE	OWNS VOICE-ENABLED DEVICE	WATCHES SPORTS VIA ONLINE STREAMING	CHECKS SPORTS SCORES ON SMART SPEAKER
	ALWAYS	SOMETIMES	NEVER. I CAN ALWAYS FIND SOMETHING TO WATCH.	N/A				
0-2 hours	12.2%	58.2%	27.5%	2.1%	45.6	33.8%	23.6%	5.6%
2-4 hours	11.5%	41.8%	25.8%	20.9%	44.8	32.9%	34.6%	8%
4+ hours	21.7%	42.4%	34.8%	1.1%	43.9	44%	50%	16.3%



Analytical Commentary

SMART SPEAKER DEMOGRAPHIC & MOST POPULAR STREAMING SITES



According to the chart on the right, respondents who check sports scores through their smart speaker are three to seven times more likely to stream sporting events. This further illustrates why services such as Amazon, the most popular site among this demographic, believe it's worth spending millions on the rights to stream sporting events and other sports-related content.

STREAMING SITES	CHECKS SPORTS SCORES ON SMART SPEAKER	
	YES	NO
Amazon	33.6%	7.1%
Facebook	34.2%	9.7%
Twitter	21.1%	3.8%
NFL.com	32.3%	6.8%
MLB.com	21.1%	3.7%
NBA.com	25.4%	3.6%
NHL.com	13.4%	3.4%
MLSsoccer.com	6.5%	1%
Other	3%	2.2%

ABOUT TIVO

TiVo Corporation (NASDAQ: TIVO) is a global leader in entertainment technology and audience insights. From the interactive program guide to the DVR, TiVo delivers innovative products and licensable technologies that revolutionize how people find content across a changing media landscape. TiVo enables the world's leading media and entertainment providers to deliver the ultimate entertainment experience. Explore the next generation of entertainment at tivo.com, forward.tivo.com or follow us on Twitter @tivo or @tivoforbusiness.



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