October 17, 2017

ACTIVATE TECH & MEDIA OUTLOOK 2018

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THE WALL STREET JOURNAL.
D.LIVE

Welcome to Activate's Tech and Media Outlook 2018

2018 will be a pivotal year for technology and media businesses; these are the major forces that will create growth opportunities and reshape companies in the year ahead.

Each year, as part of the Wall Street Journal D.Live Conference, we take a deep dive into some of the major consumer trends, technology innovations, and industry dynamics that will predict what is going to happen next and what it will mean.

We are excited to share our third annual Outlook, and hope you will enjoy it for many of its surprising and unexpected insights. From the trajectory of smart speakers, to the future of reality computing (AR/VR), to the global eCommerce business, we've uncovered key insights and likely trends. There is also an extensive evaluation of the creators who drive billions of web video views, a hard look at the news business, and a view into the likely price wars ahead in streaming video. Forecasts include how consumers will spend their tech and media time, the next wave of internet and media revenues, and the rise of Super Users – who will be critical to acquire and retain.

On each slide you will find extensive analysis, drawing on proprietary industry research and large-scale surveys representing the U.S. population.

We know you'll find the results both provocative and useful, and look forward to a lively discussion.

Let's see where tech and media are headed!

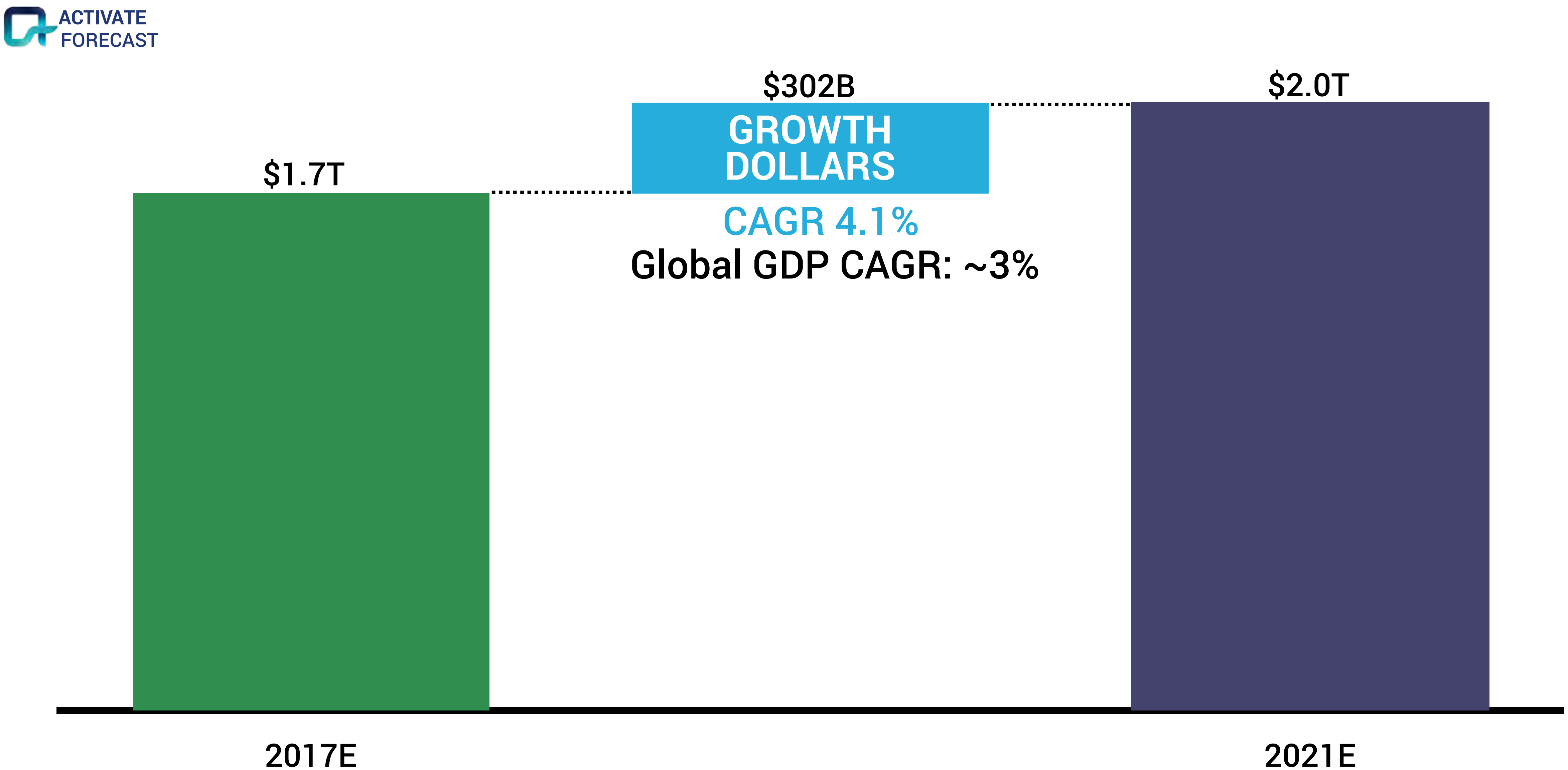
The Activate Team

The Most Important Insights for Tech and Media in 2018

The Most Important Insights for Tech and Media in 2018

We forecast that over the next four years, global Internet and media revenues will grow by approximately $300 billion, continuing to outpace GDP growth

CONSUMER INTERNET AND MEDIA REVENUES[1], GLOBAL, 2017E-2021E, USD

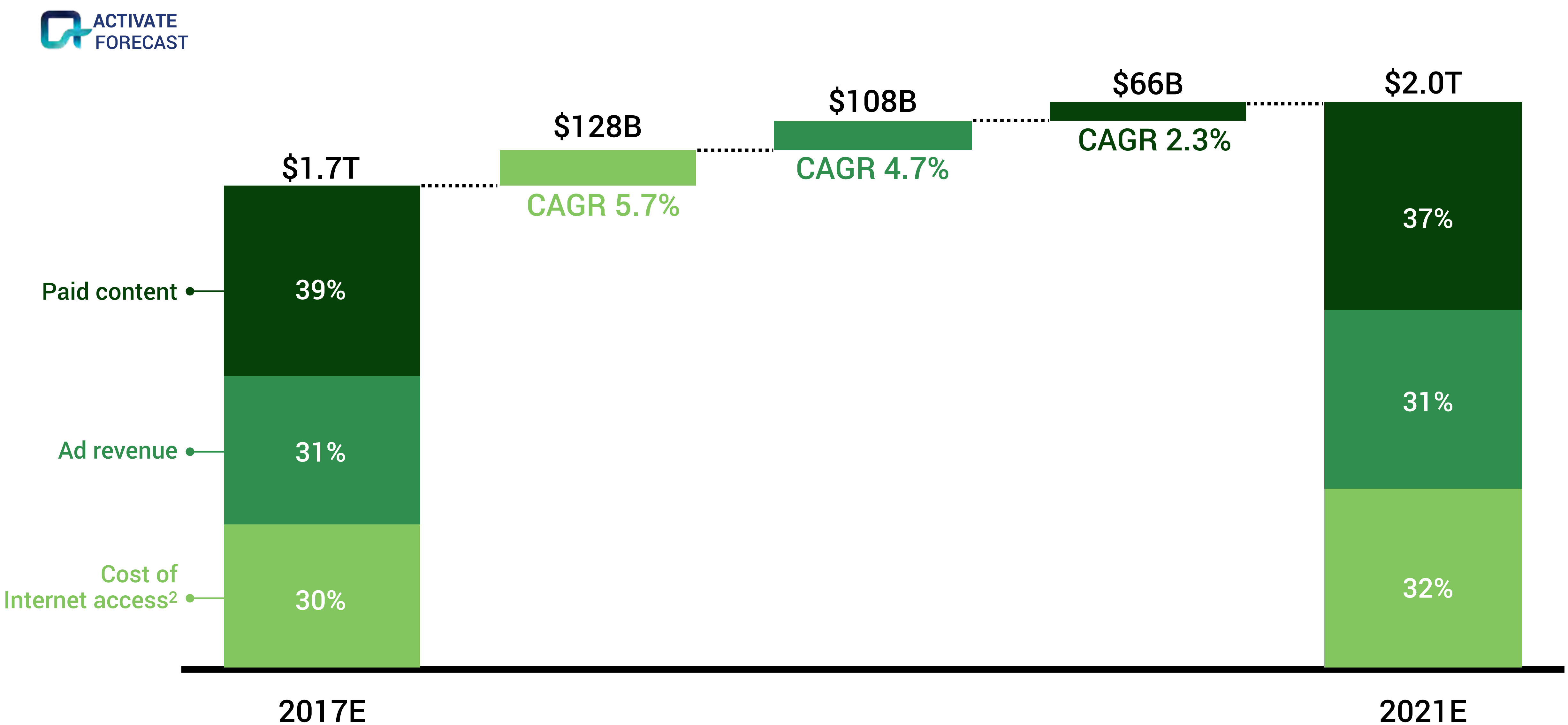


1. Consumer Internet and Media Revenues include radio, recorded music, magazine publishing, newspaper publishing, video games, filmed entertainment, book publishing, TV subscription and licensing fees, Internet access, digital advertising, and traditional advertising on these platforms.

Sources: Activate analysis, eMarketer, GroupM, IBISWorld, IFPI, International Monetary Fund, NewZoo, PricewaterhouseCoopers, RBC, World Bank, ZenithOptimedia

Access will lead revenue growth for tech and media companies

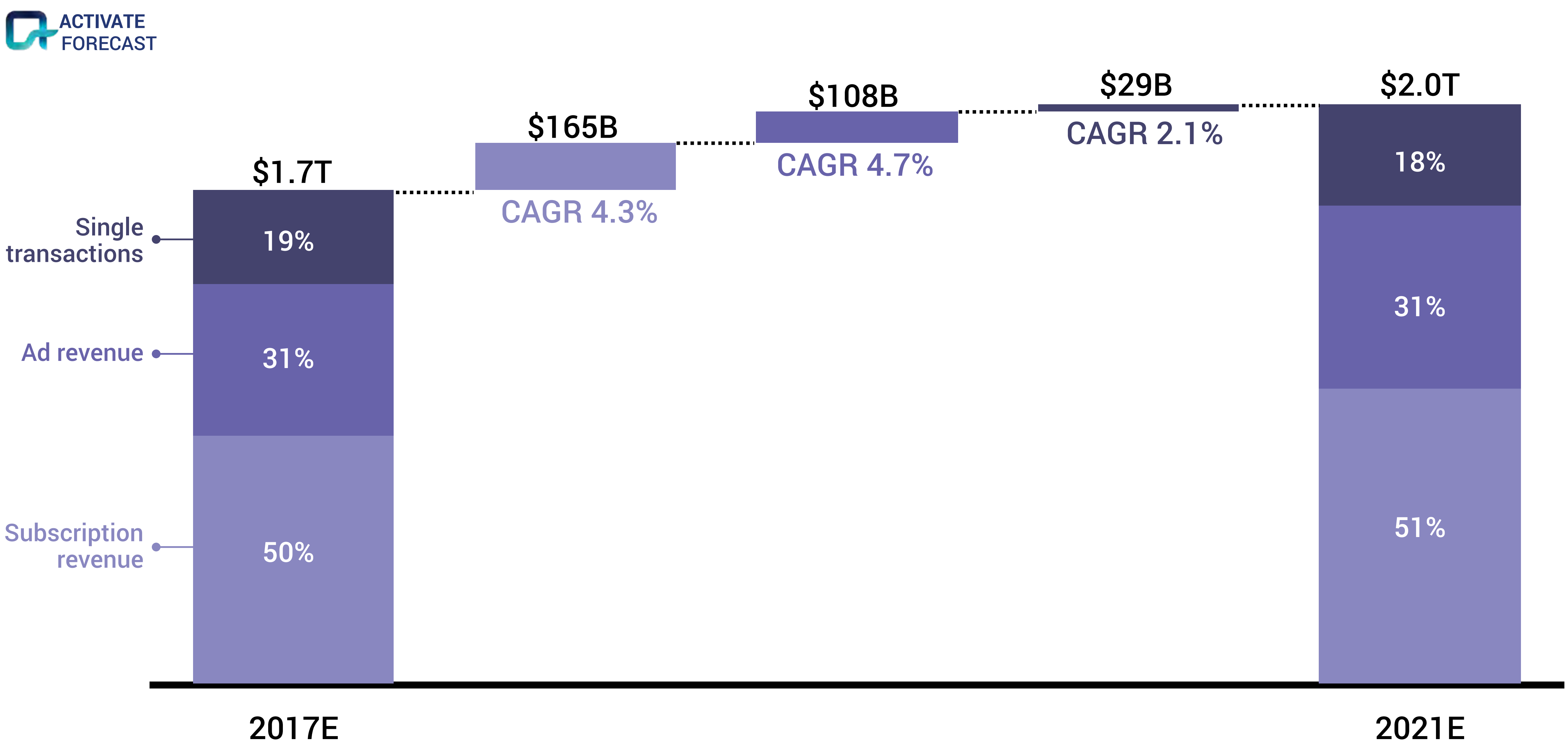
CONSUMER INTERNET AND MEDIA REVENUE GROWTH BY SEGMENT[1], GLOBAL, 2017E-2021E, USD



1. Consumer Internet and Media Revenues include radio, recorded music, magazine publishing, newspaper publishing, video games, filmed entertainment, book publishing, TV subscription and licensing fees, Internet access, digital advertising, and traditional advertising on these platforms.
2. Includes fixed broadband, wireless, and mobile Internet access.
Sources: Activate analysis, eMarketer, GroupM, IBISWorld, IFPI, International Monetary Fund, NewZoo, PricewaterhouseCoopers, RBC, World Bank, ZenithOptimedia

Subscription will be the primary revenue model, accounting for over half of consumer Internet and media growth

CONSUMER INTERNET AND MEDIA REVENUE GROWTH BY REVENUE MODEL[1], GLOBAL, 2017E-2021E, USD



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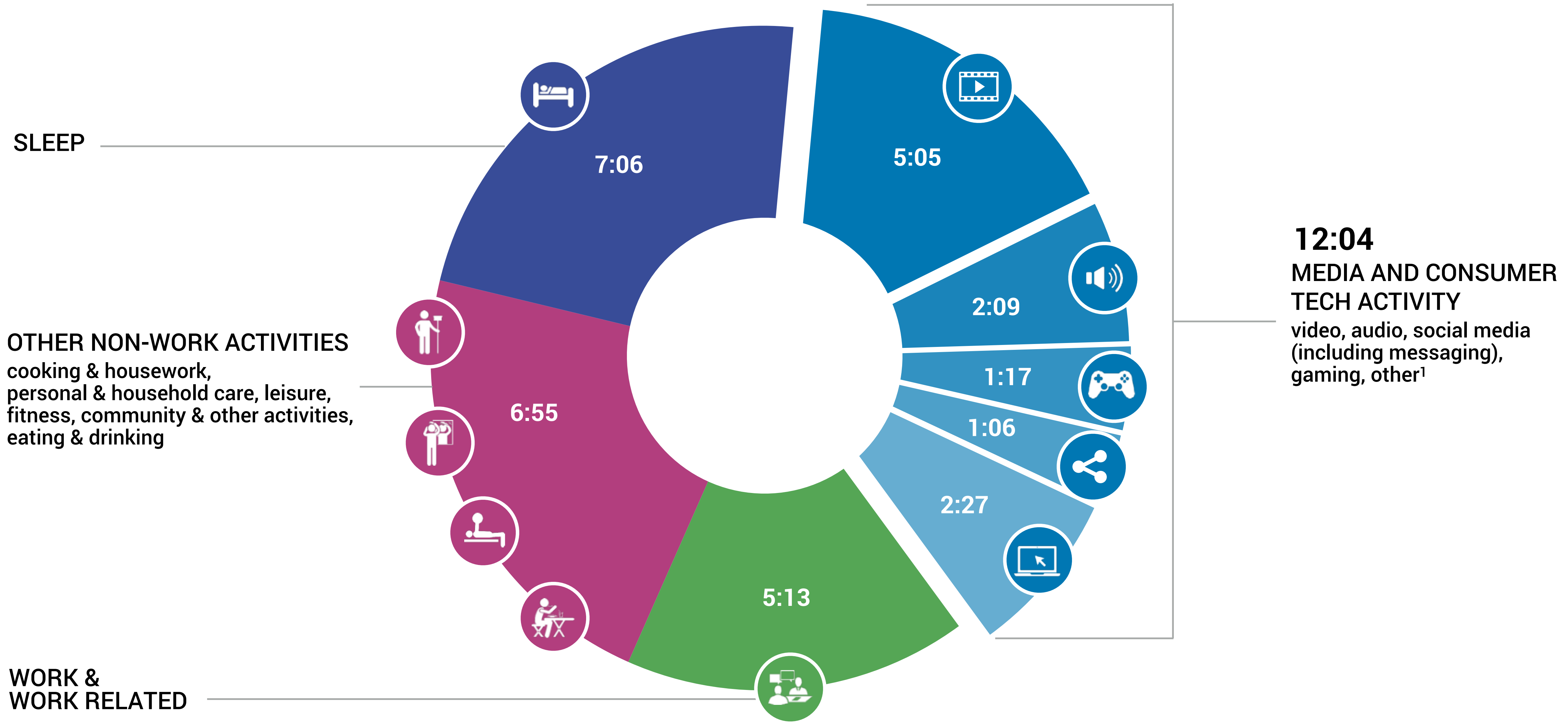
The Most Important Insights for Tech and Media in 2018

Our analysis shows that multi-tasking means that there are 31 hours a day for the average American; 12 hours are spent consuming tech and media

AVERAGE DAY BY ACTIVITY PER ADULT (AGE 18+), U.S., 2016, HOURS:MINUTES

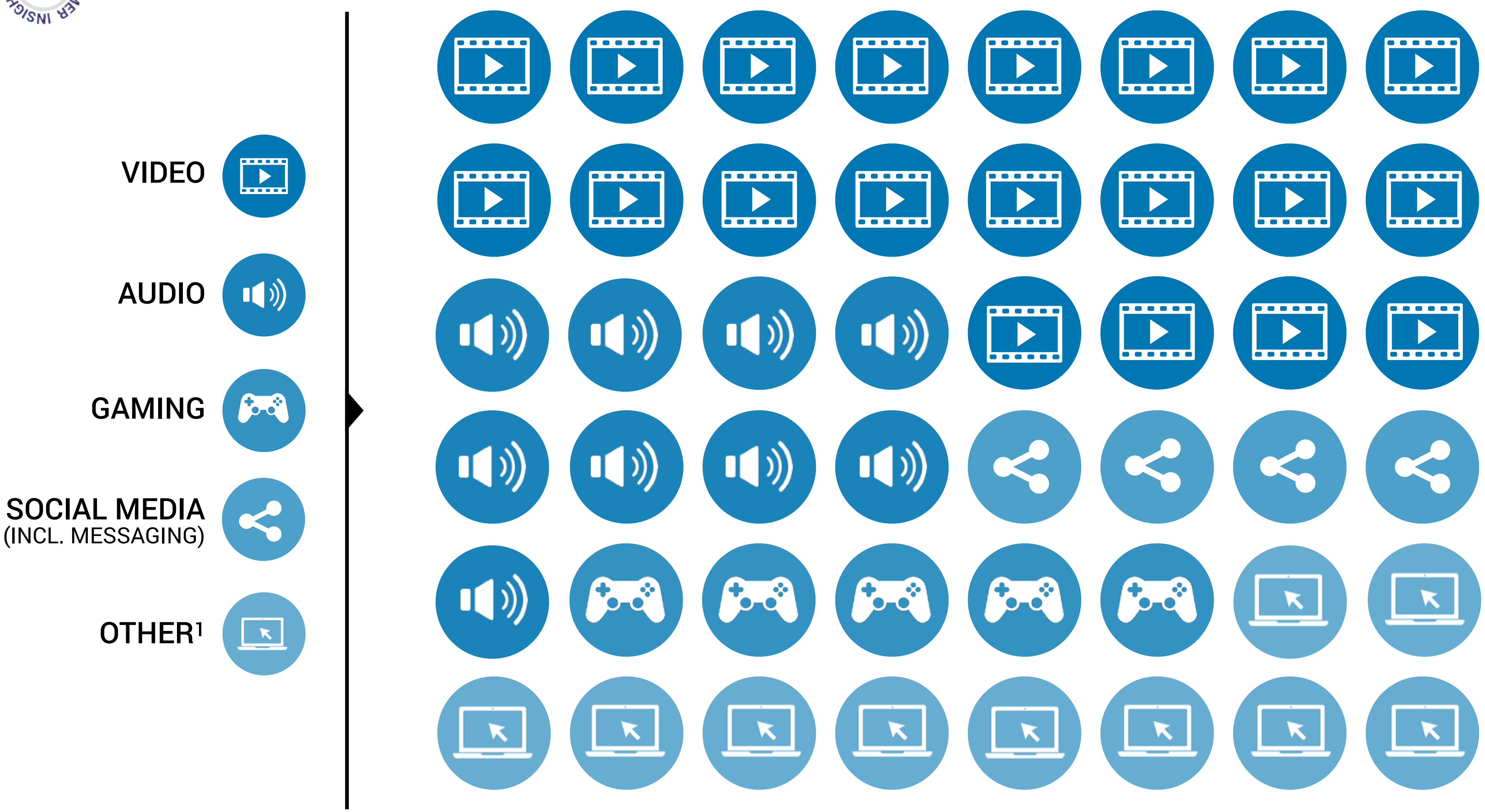


Note: Behaviors averaged over 7 days.
1. Other includes browsing websites, offline reading, cinema, out-of-home, etc.
Sources: Activate analysis, Activate 2016 Consumer Tech & Media Research Study (n=1,003), comScore, eMarketer, Gallup, GWI, IAB, National Sleep Foundation, Nielsen, Pew Research, U.S. Bureau of Labor Statistics

On average, video captures the largest share of attention of the daily 12 hours of tech and media consumption

DAILY MEDIA ATTENTION PER ADULT (AGE 18+), U.S., 2016, 15-MINUTE INTERVALS

A TYPICAL 12:04-HOUR MEDIA DAY : 48 X 15-MINUTE INTERVALS



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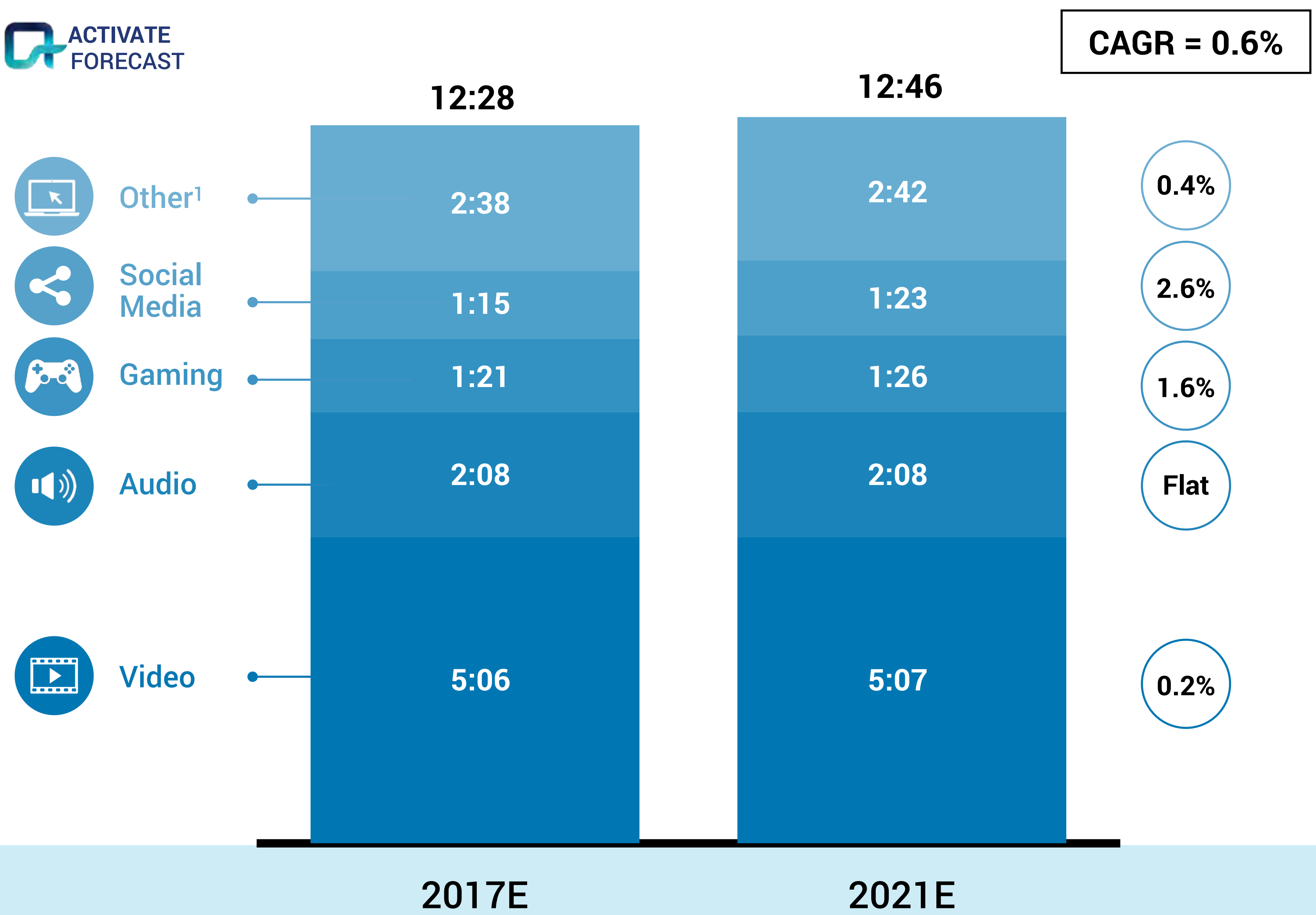
Sources: Activate analysis, Activate 2016 Consumer Tech & Media Research Study (n=1,003), comScore, eMarketer, Gallup, GWI, IAB, National Sleep Foundation, Nielsen, Pew Research, U.S. Bureau of Labor Statistics

By 2021, Americans will spend an additional 18 minutes with tech and media daily

DAILY HOURS SPENT PER ADULT (AGE 18+), U.S., 2017E-2021E, HOURS:MINUTES



FURTHER EXPANSION DRIVERS

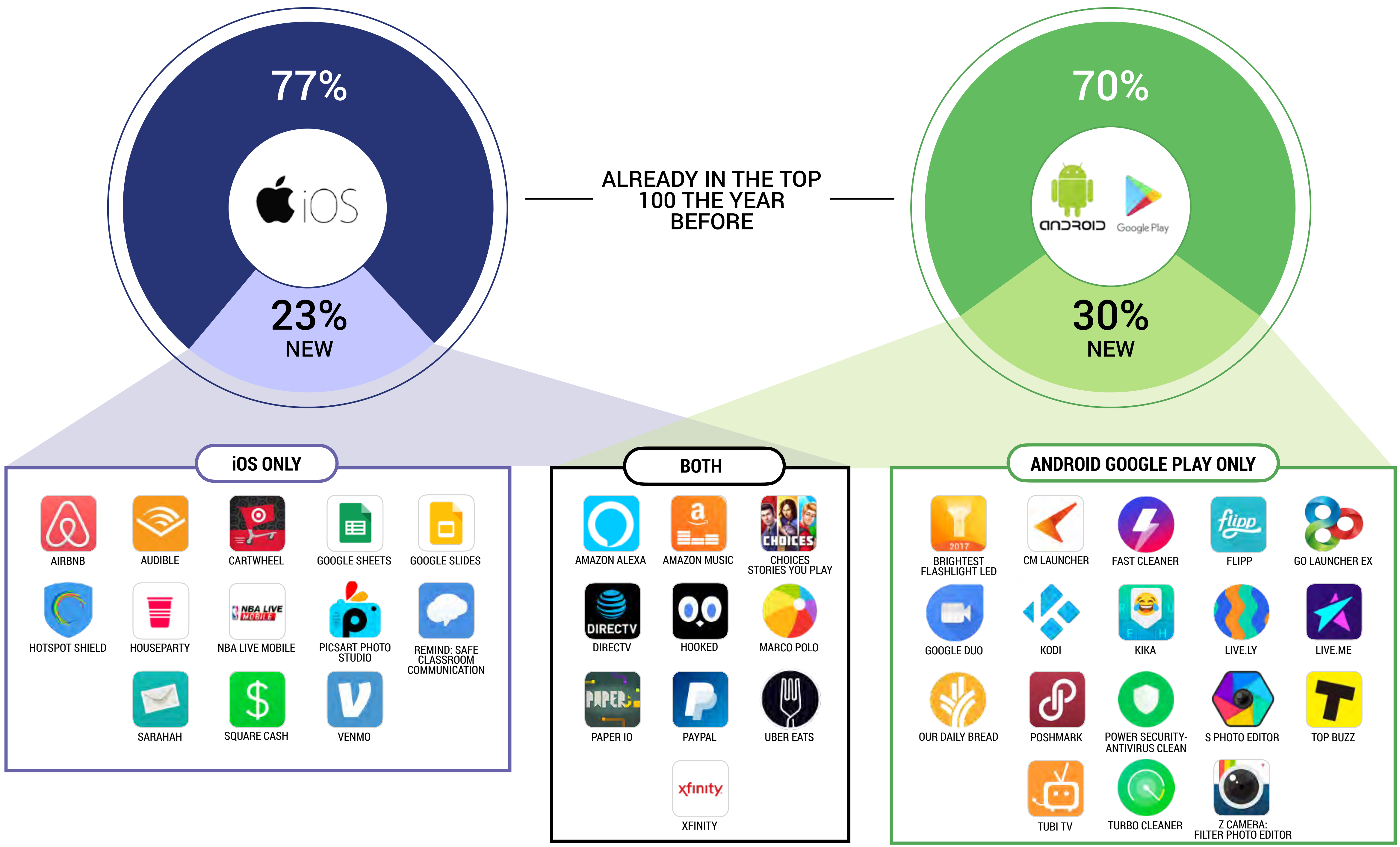
SMART SPEAKERS will drive audio listening (and video consumption for units with screens)

SELF DRIVING CARS will allow for more multitasking across the board

Note: Behaviors averaged over 7 days.
1. Other includes browsing websites, offline reading, cinema, out-of-home, etc.
Sources: Activate analysis, Activate 2016 Consumer Tech & Media Research Study (n=1,003), comScore, eMarketer, Gallup, GWI, IAB, National Sleep Foundation, Nielsen, Pew Research, U.S. Bureau of Labor Statistics

New services continue to drive adoption addressing new user behaviors such as smart speakers and mobile video

TOP 100 APPS BY DOWNLOADS, U.S., SEP 2016-AUG 2017, % TOP 100



Sources: Activate analysis, AppAnnie, Apple App Store, Google Play

The Most Important Insights for Tech and Media in 2018

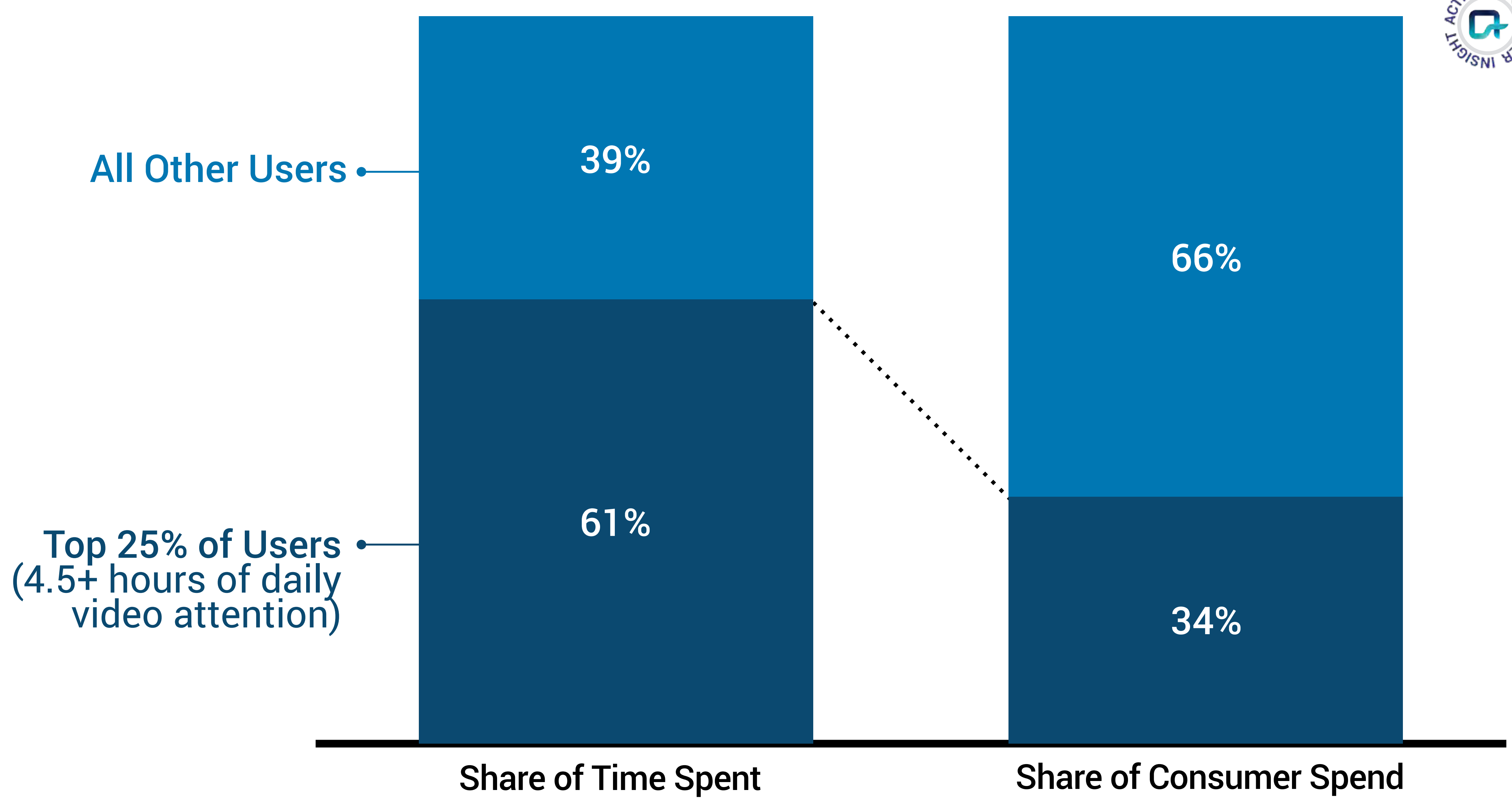
Targeting Super Users will be critical to the growth strategies of all tech and media companies

- Tech and media companies can learn a great deal from the behavior of Super Users in their sector. Super Users are in the vanguard of behavior and usage
- Super User behaviors give clues to how overall consumer behavior will evolve and inform how tech and media businesses acquire and engage users
- Acquiring, growing, and retaining Super Users will be a key pillar of the strategies of any tech and media company

Source: Activate analysis

Video Super Users account for a disproportionate amount of time and also over-index on spend

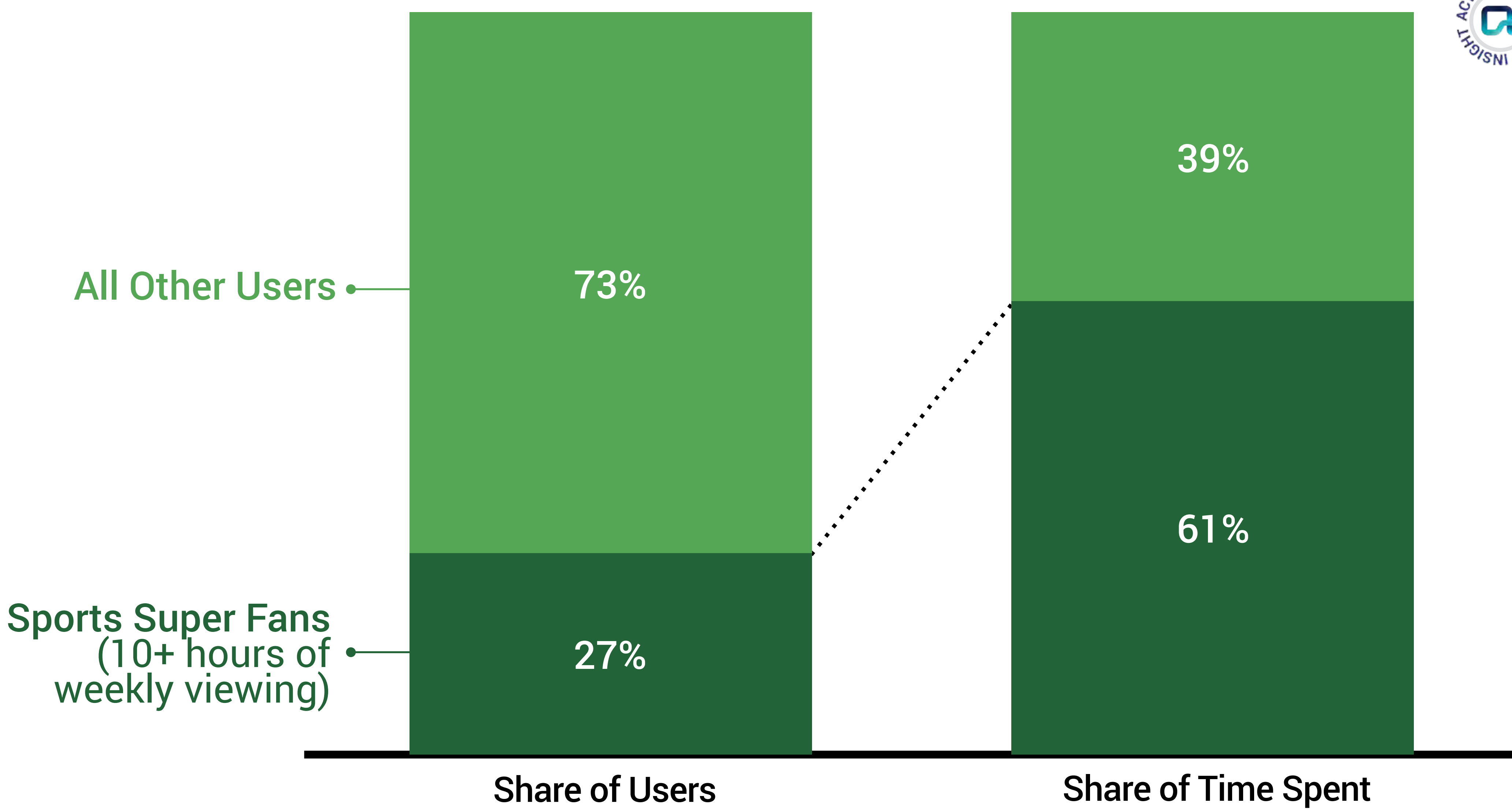
VIDEO TIME AND SPEND RELATIVE TO SHARE OF USERS, U.S., 2017, % TOTAL



Sources: Activate analysis, Activate 2017 Consumer Tech & Media Research Study (n=3,515)

Sports Super Fans follow the same trend as other video Super Users

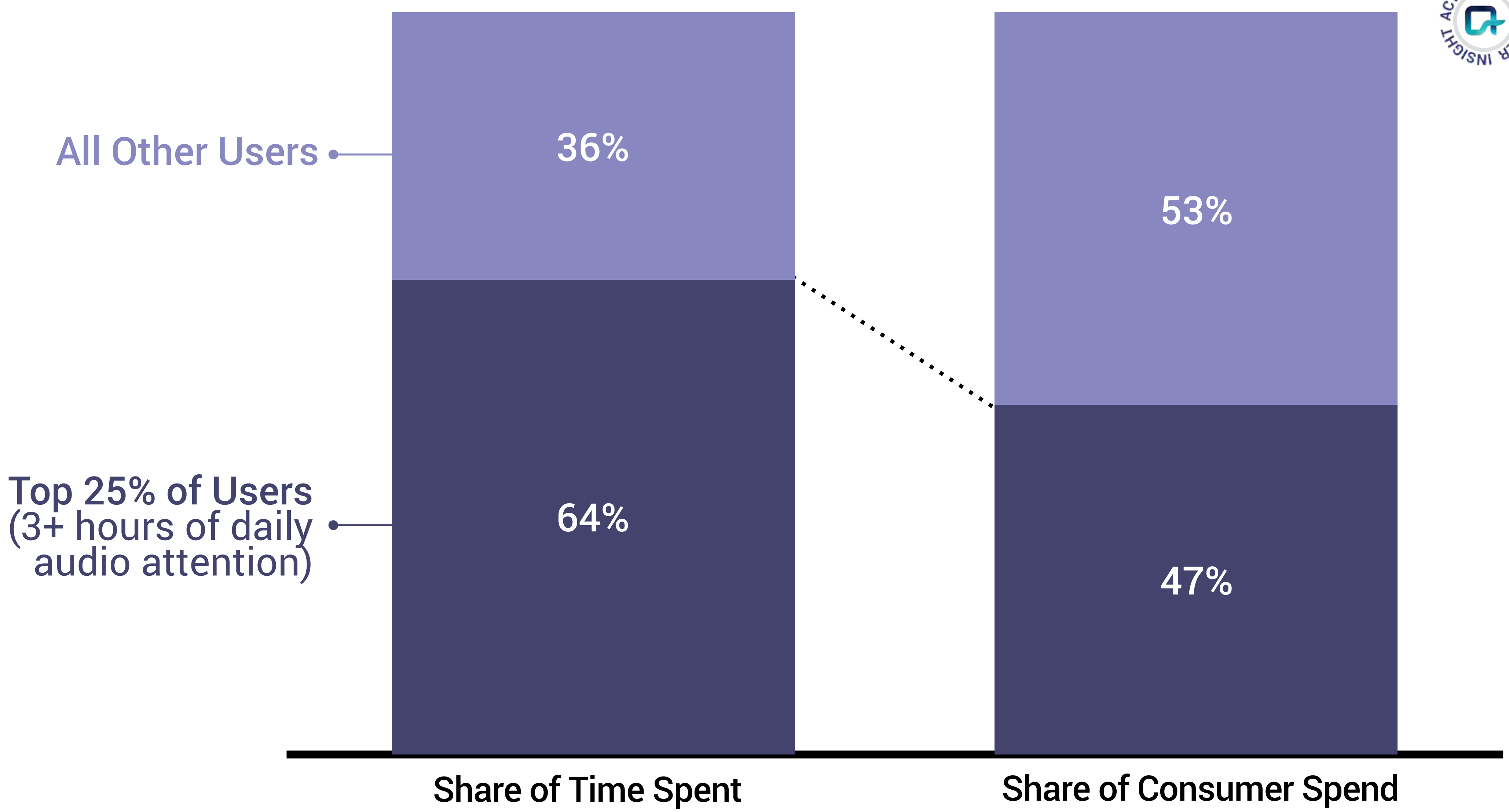
SPORTS FANS AND TIME SPENT RELATIVE TO SHARE OF USERS, U.S., 2017, % TOTAL



Sources: Activate analysis, Activate 2017 Consumer Tech & Media Research Study (n=2,406)

In audio, Super Users account for almost half of all consumer spend

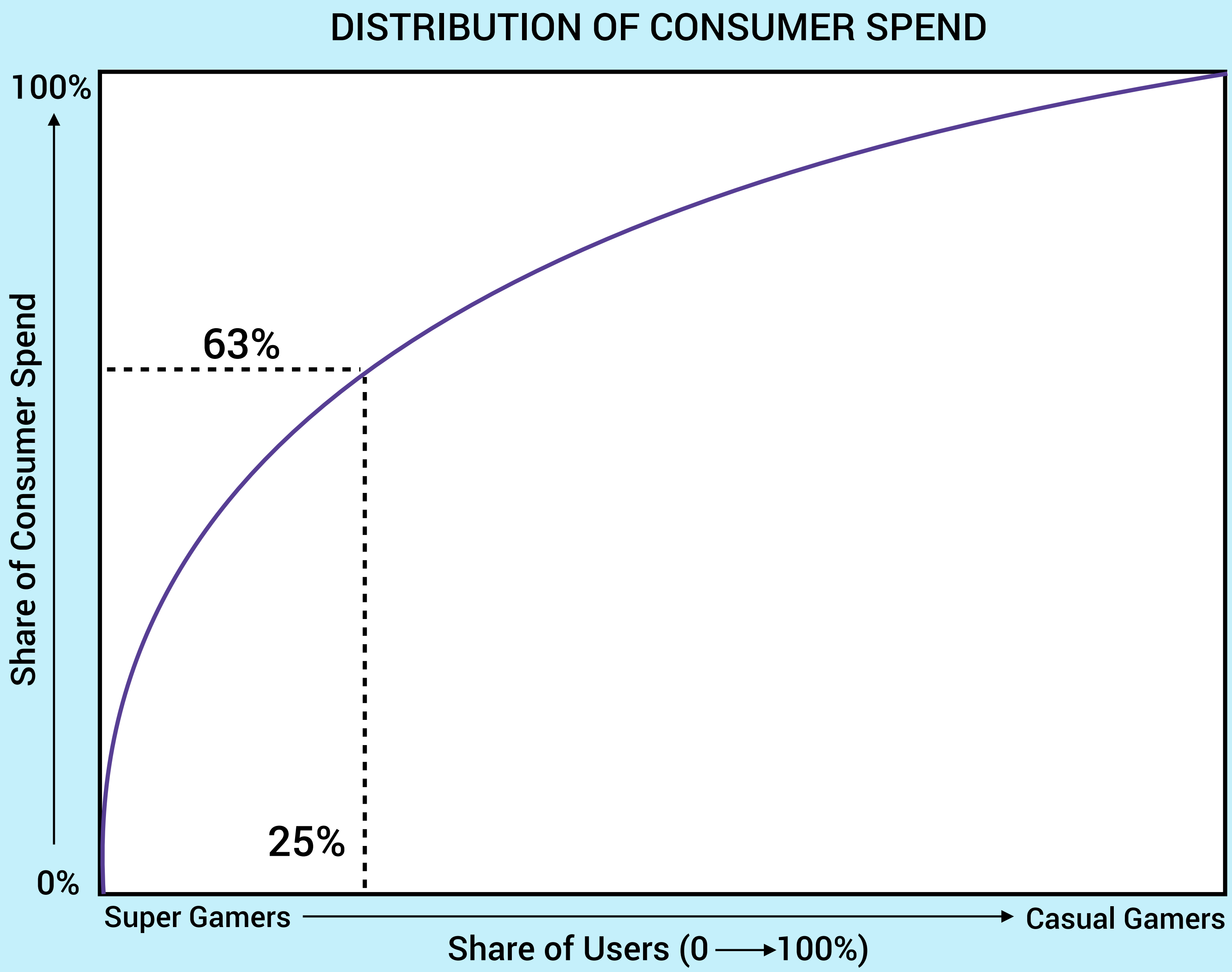
AUDIO TIME AND SPEND RELATIVE TO SHARE OF USERS, U.S., 2017, % TOTAL



Sources: Activate analysis, Activate 2017 Consumer Tech & Media Research Study (n=2,645)

In video games, the curve is even steeper; Super Users are the core of gaming

GAMING CONSUMER SPEND RELATIVE TO SHARE OF USERS, U.S., 2017, % TOTAL

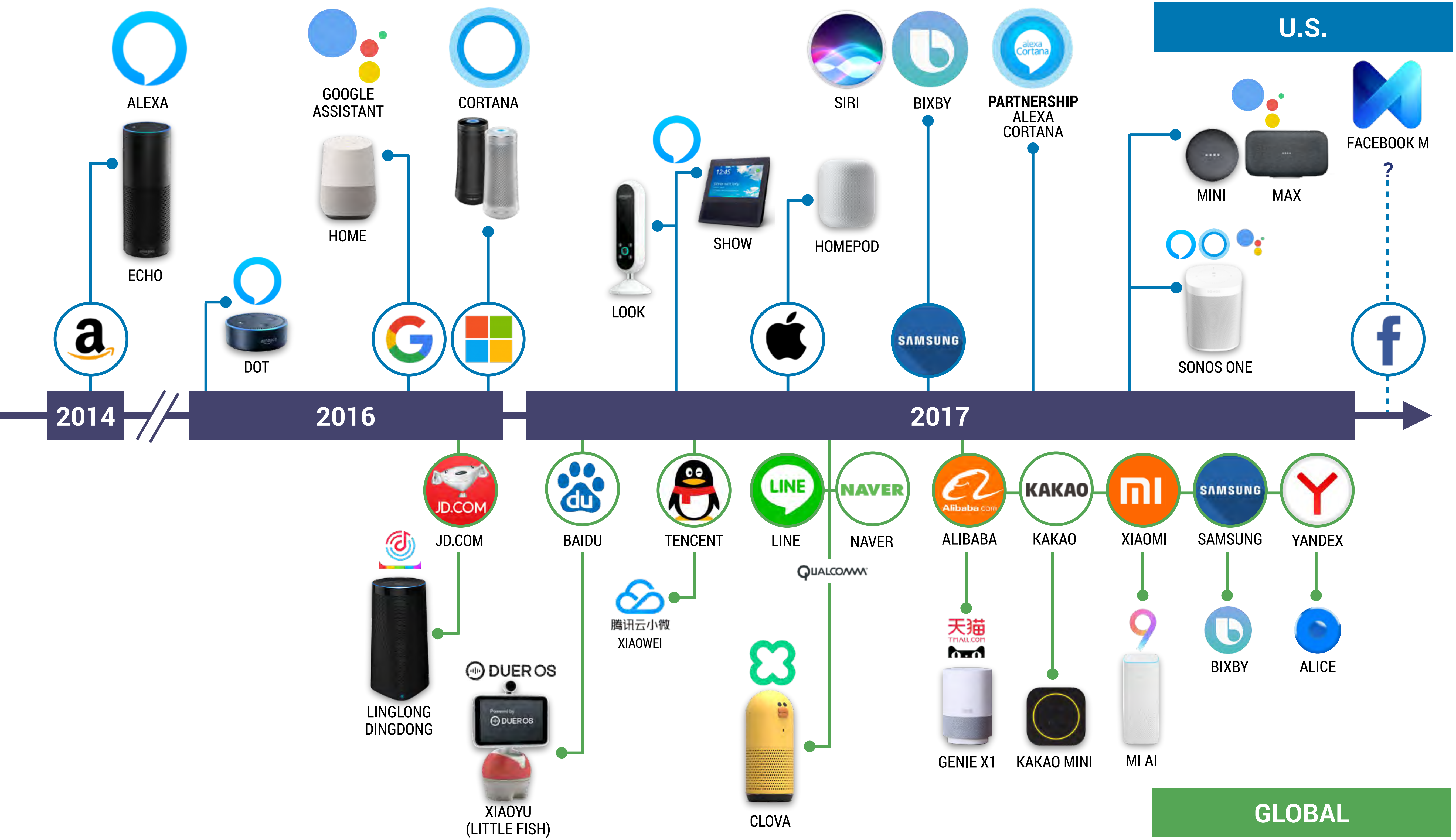


TIME SPEND:
Top 25% of gamers generate 70% of play time

Sources: Activate analysis, Activate 2017 Consumer Tech & Media Research Study (n=2,645)

The Most Important Insights for Tech and Media in 2018

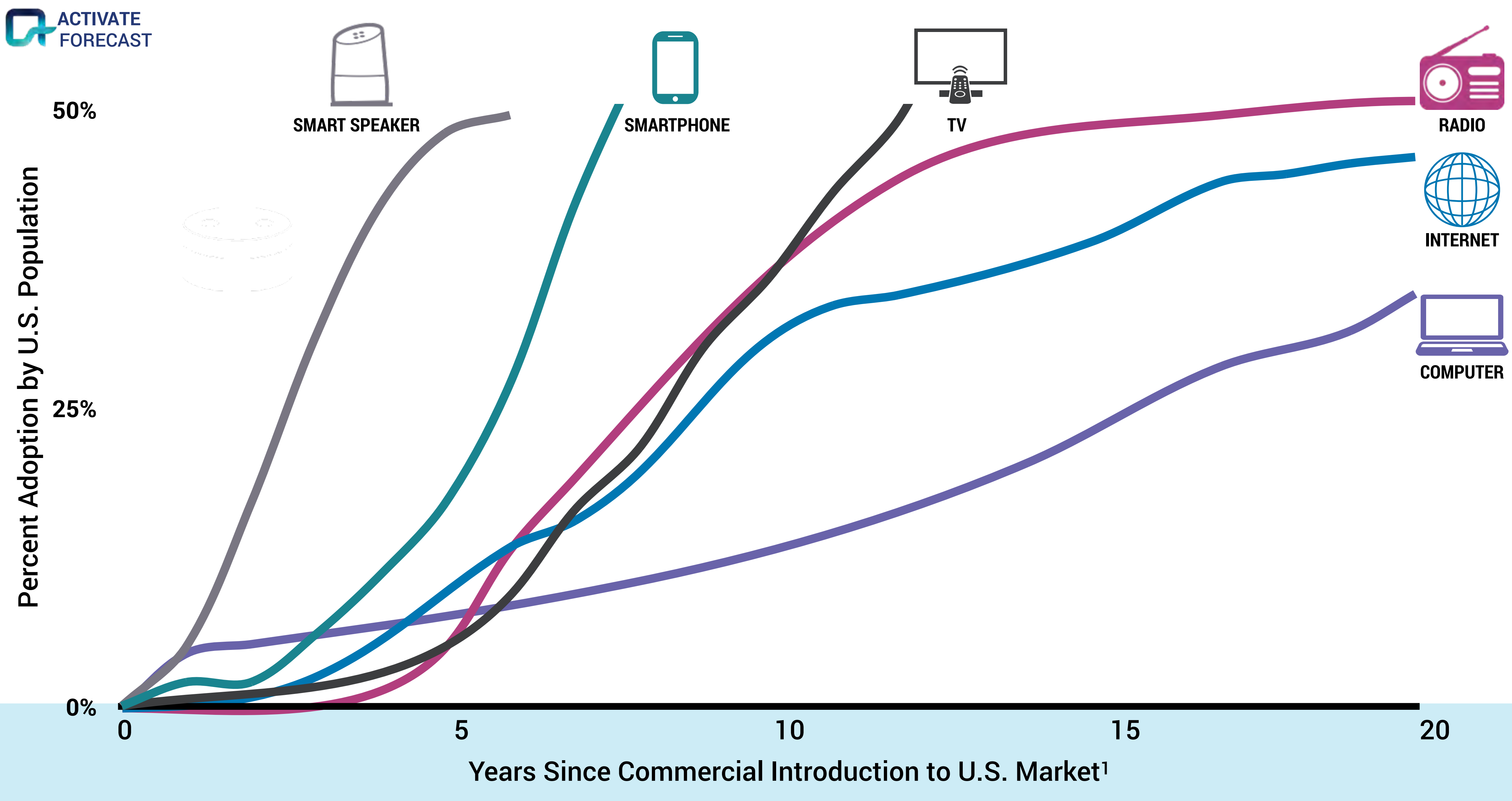
The smart speaker battles are not really about the device; the battles began in 2014 and escalated over the last two years



Note: Positioning represents either product announcement or launch date.
Sources: Activate analysis, Company press releases, Press reports

We forecast that smart speaker adoption is likely to be faster than any other consumer device; however sales will not grow to the sky

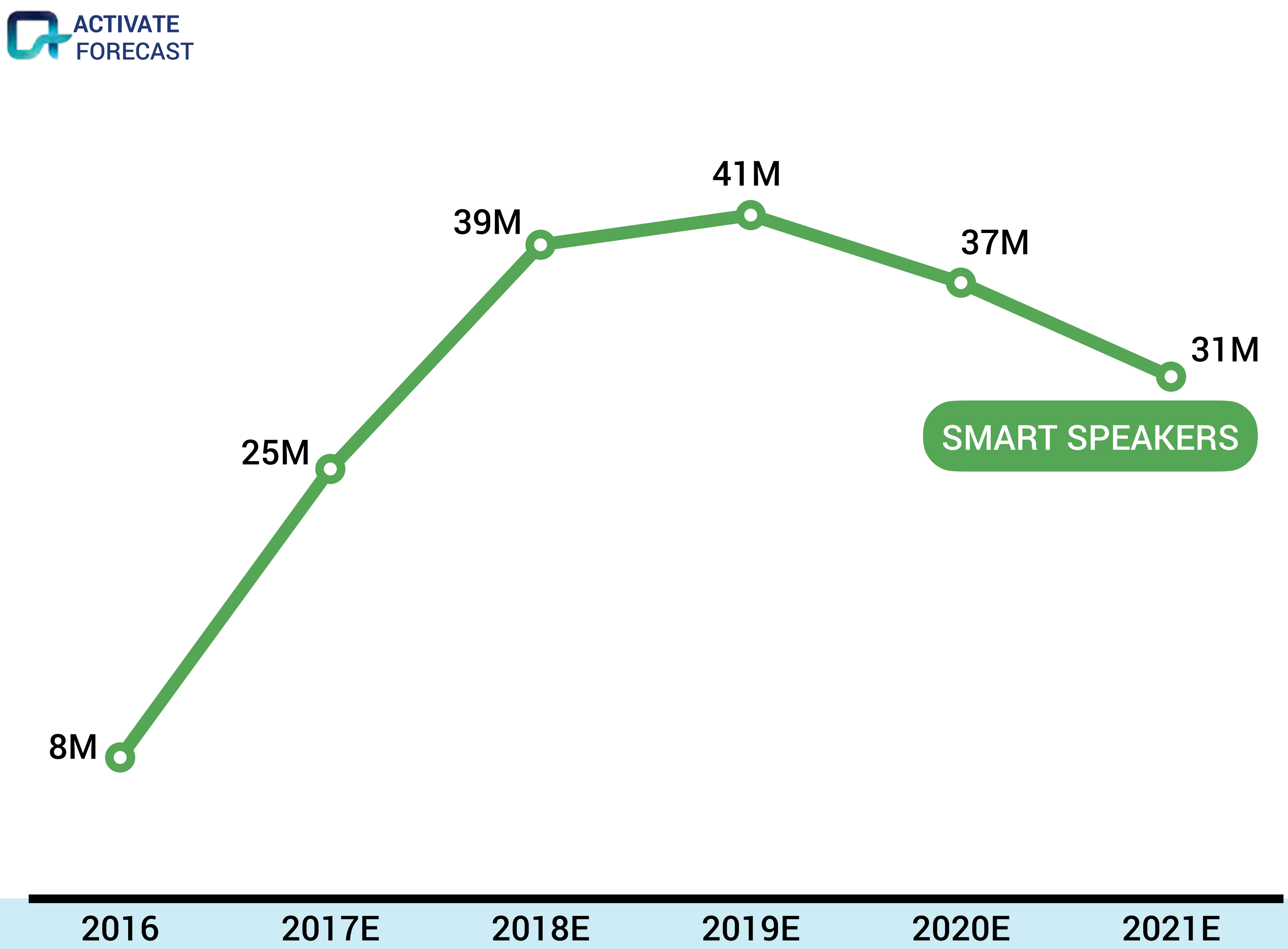
SMART SPEAKER PENETRATION, U.S., YEARS FROM INCEPTION, % POPULATION



1. Radio, TV, and computer measured as share of U.S. households. Smartphone and Internet measured as share of U.S. population.
Sources: Activate analysis, U.S. Census Bureau, World Bank

In fact, we forecast that device sales are likely to peak as digital assistants with conversational interfaces break free from the smart speaker

SMART SPEAKER UNIT SALES, U.S., 2016-2021E, **MILLION UNITS**



SLOWDOWN FACTORS

ALTERNATIVE ACCESS TO VOICE will be embedded throughout the home via smart home devices, removing the need for a speaker

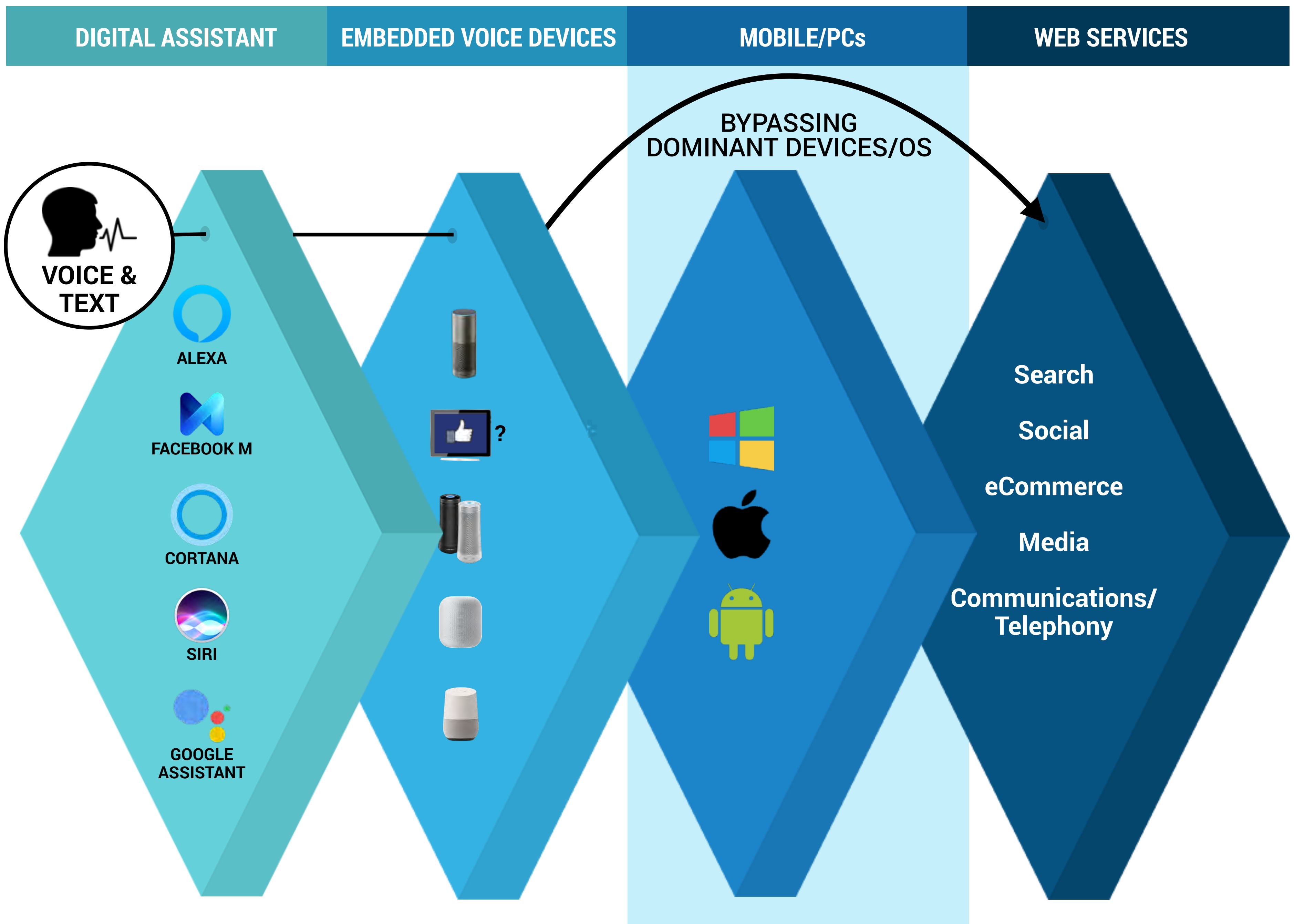
LONGER REFRESH CYCLES for smart speakers compared to smartphones, which refresh roughly every 30 months

SINGLE USE DEVICES akin to smart speakers (e.g. standalone GPS devices, dedicated e-readers, etc.) exhibited comparable declines in unit sales

Sources: Activate analysis, Business Insider, Consumer Intelligence Research Partners, Edison Research, eMarketer, Evercore, KGI Securities, MIDiA, Morgan Stanley, Voicebot.ai

The smart speaker battles are really the digital assistant war; the stakes are high

TECHNOLOGY LAYERS TO ACCESS WEB SERVICES

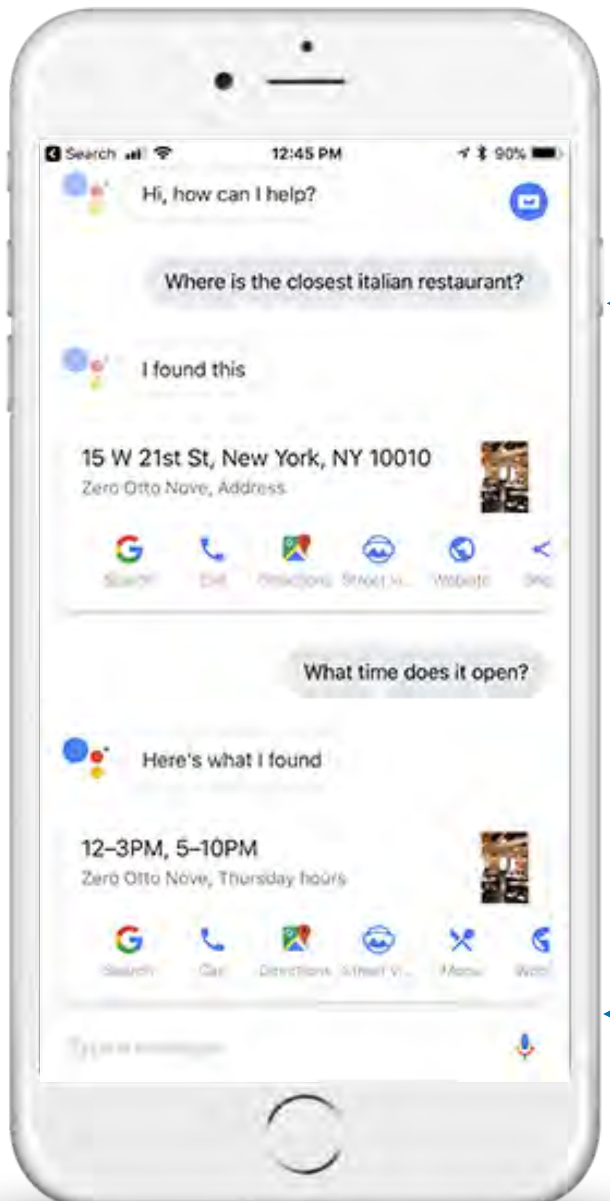


- The **true objective of each of the tech companies is to own the digital assistant via the conversational interface** — creating a layer between the consumer and other services (e.g. search, social, communications, media, hardware)
- Allowing someone else to own the dominant digital assistant creates **an existential threat for the major technology companies**
- To be relevant in the early stages of the digital assistant battle, each of the tech companies has started with a dedicated smart speaker — **essentially a trojan horse to deliver AI into the home**
- Ultimately, we expect that the hardware will become a commodity, and the **digital assistant will be ubiquitous through a broad set of devices**

Most of the digital assistants are already messaging bots – enabled through either a voice or text conversational interface

VIRTUAL ASSISTANCE IN MESSAGING

SEARCH VIA DIGITAL ASSISTANT

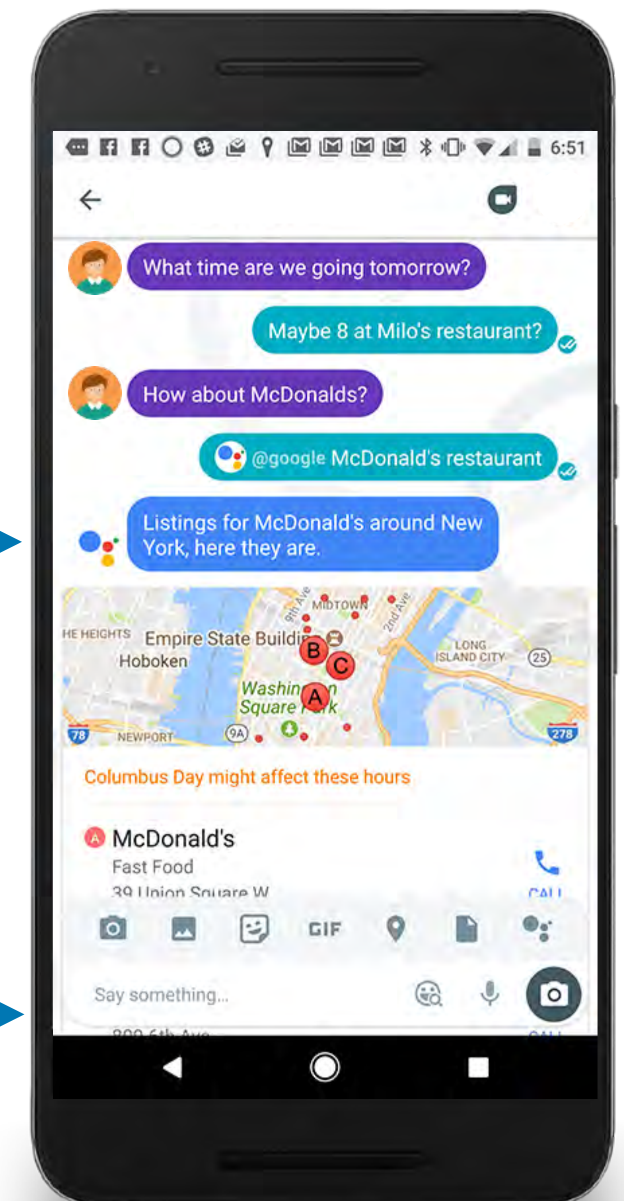


Digital assistants on mobile use familiar messaging interfaces to build user comfort, while capturing valuable data and improving conversational understanding

Digital assistants also provide relevant and timely suggestions mid-conversation

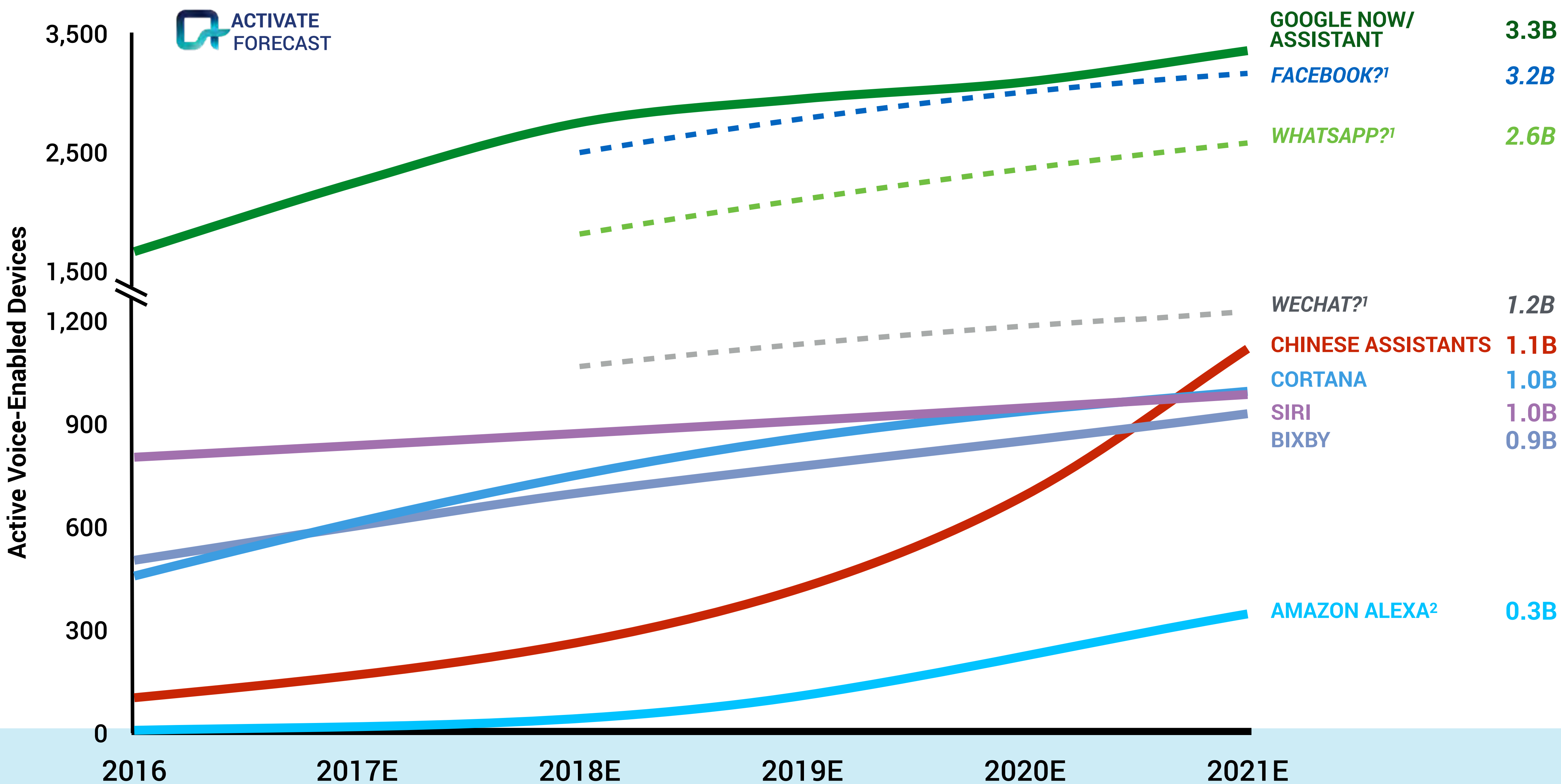
Users can interact with digital assistants either through voice or text, and on multiple mobile platforms

DIGITAL ASSISTANCE IN MESSAGING CONVERSATION



We forecast that digital assistants will reach escape velocity as they are embedded in messaging and available across the largest population of devices

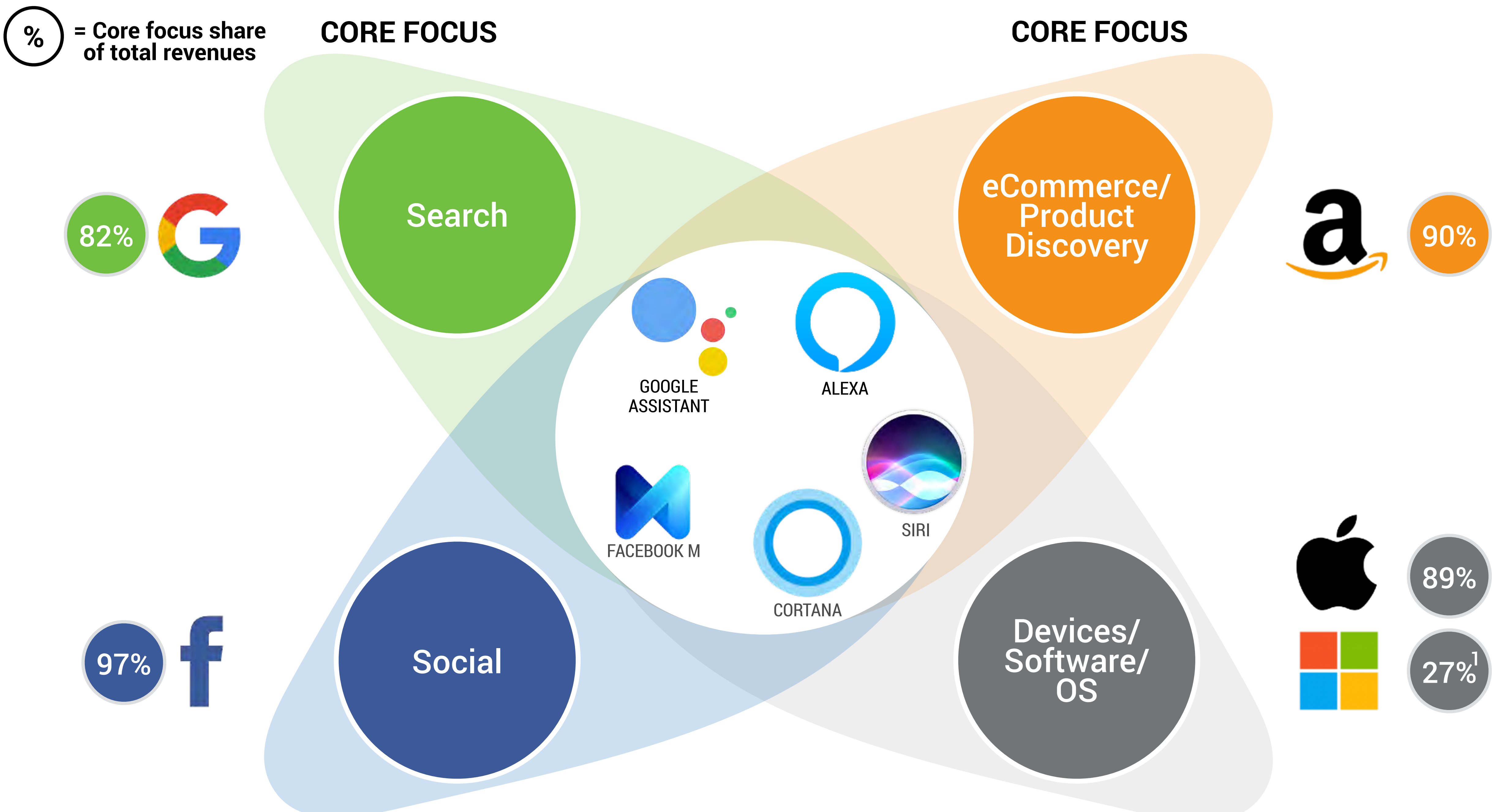
VOICE ASSISTANT INSTALL BASE ON ACTIVE DEVICES, GLOBAL, 2016-2021E, MILLIONS



1. Monthly active users on each platform, though none currently have digital assistants.
2. Amazon Alexa is exclusive to Alexa-only devices and does not include Cortana integration.
Sources: Activate analysis, eMarketer, Facebook, Google, IHS, Microsoft, Ovum, RBC, SNL Kagan, Strategy Analytics, TechRepublic, Voicebot.ai

Each of the tech companies views owning their digital assistant as part of their manifest destiny – protecting their core and tapping into new growth dollars

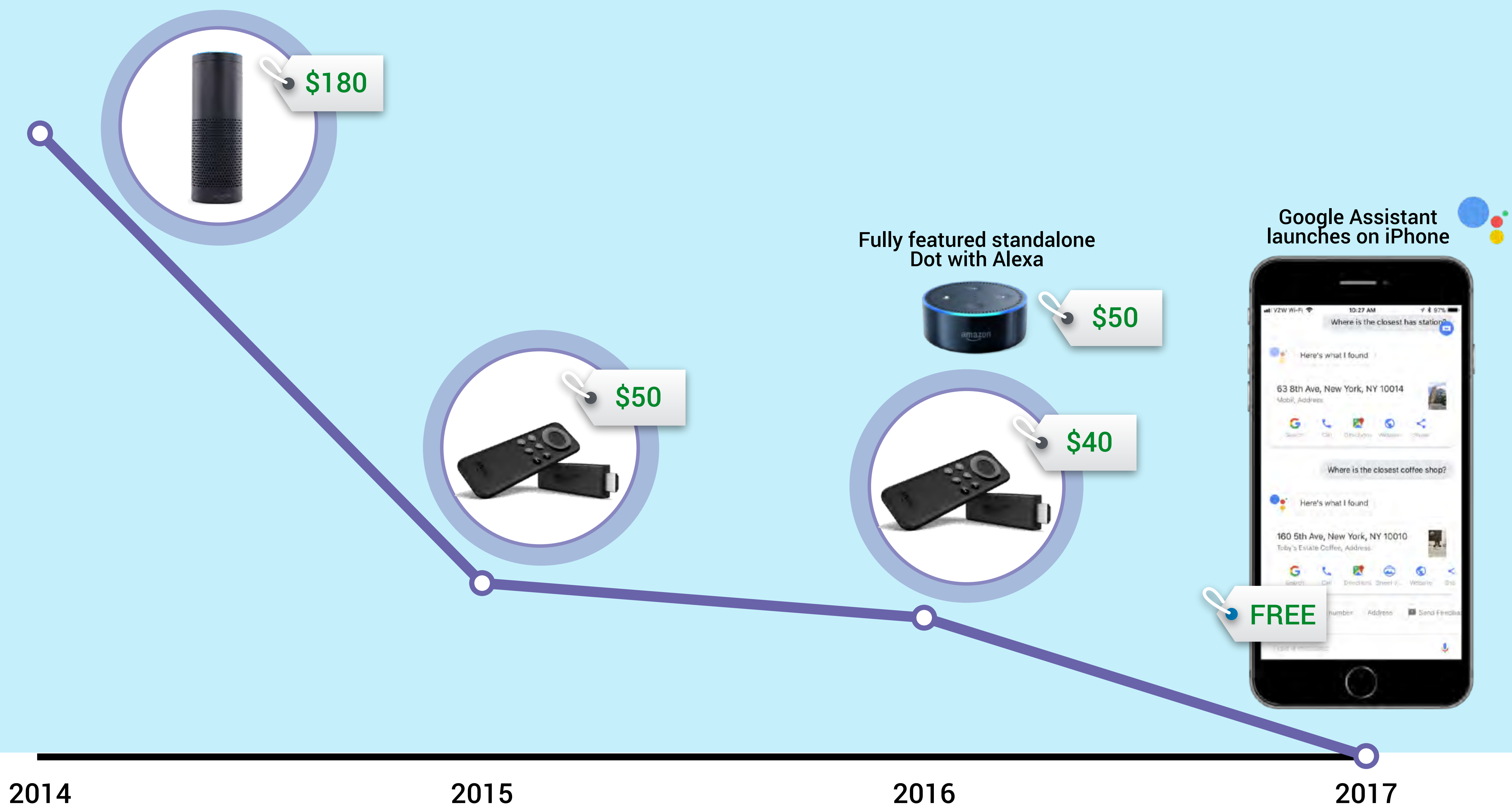
CORE BUSINESS SHARE OF REVENUE, GLOBAL, 2016, % REVENUE



1. Excludes office and enterprise software.
Sources: Activate analysis, Company financials

Sales of high-end devices will continue but we forecast that the cost of accessing a digital assistant will head to zero

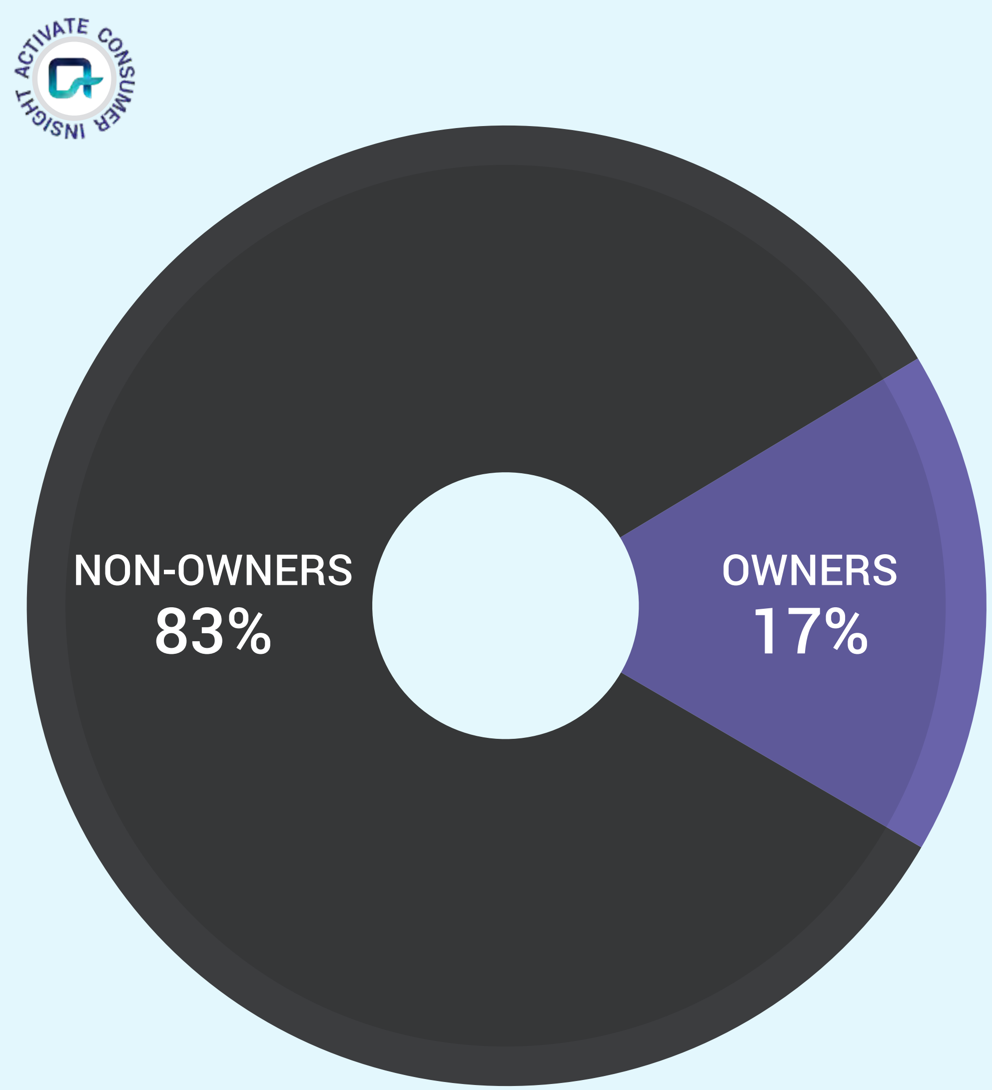
ENTRY PRICE POINTS FOR DIGITAL ASSISTANT-ENABLED DEVICES, U.S., 2014-2017, USD



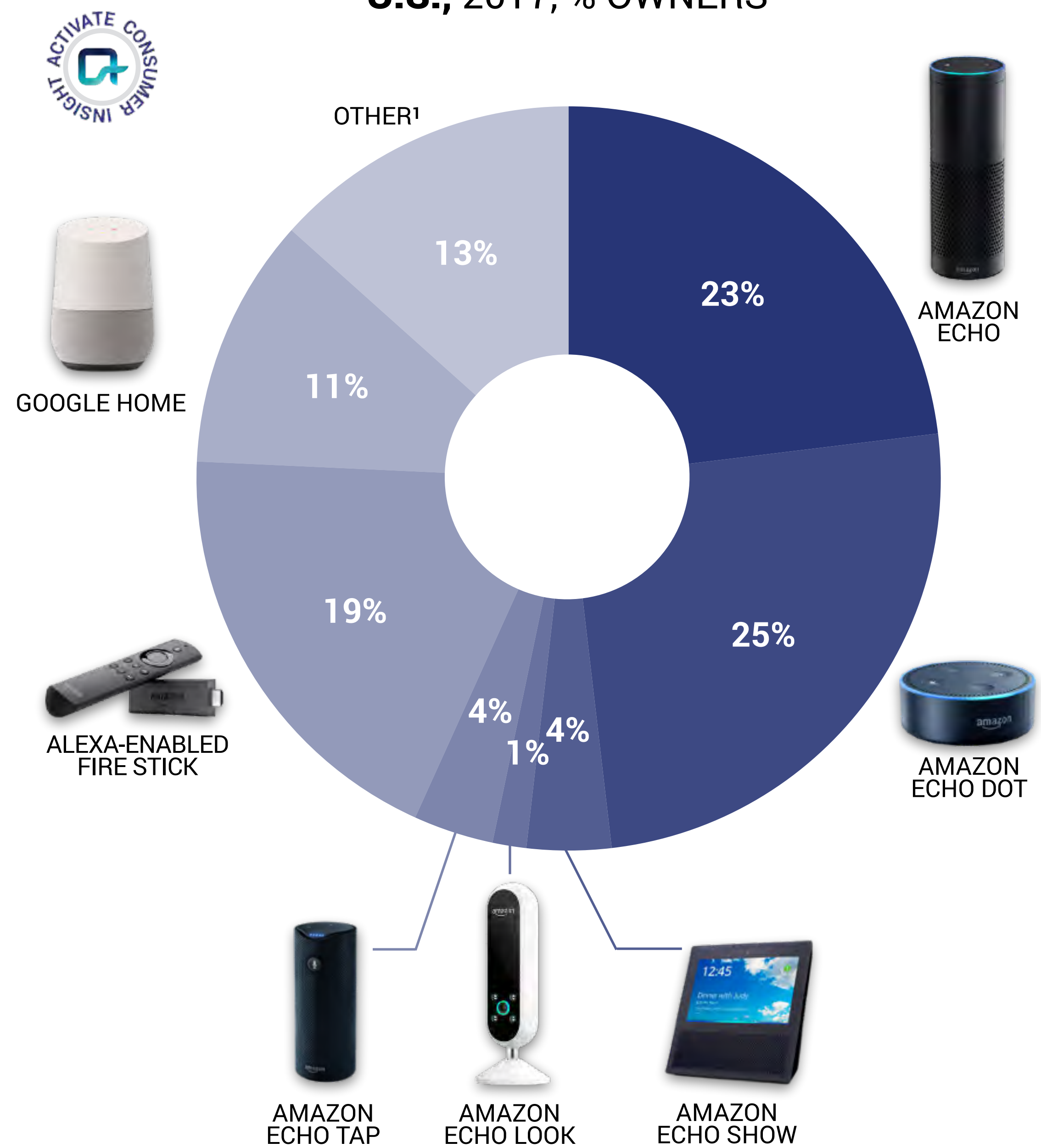
Sources: Activate analysis, Amazon, Google

Today, 17 percent of US consumers own a smart speaker; the great majority are Amazon Echo

SHARE OF SMART SPEAKER OWNERS, U.S., 2017, % POPULATION



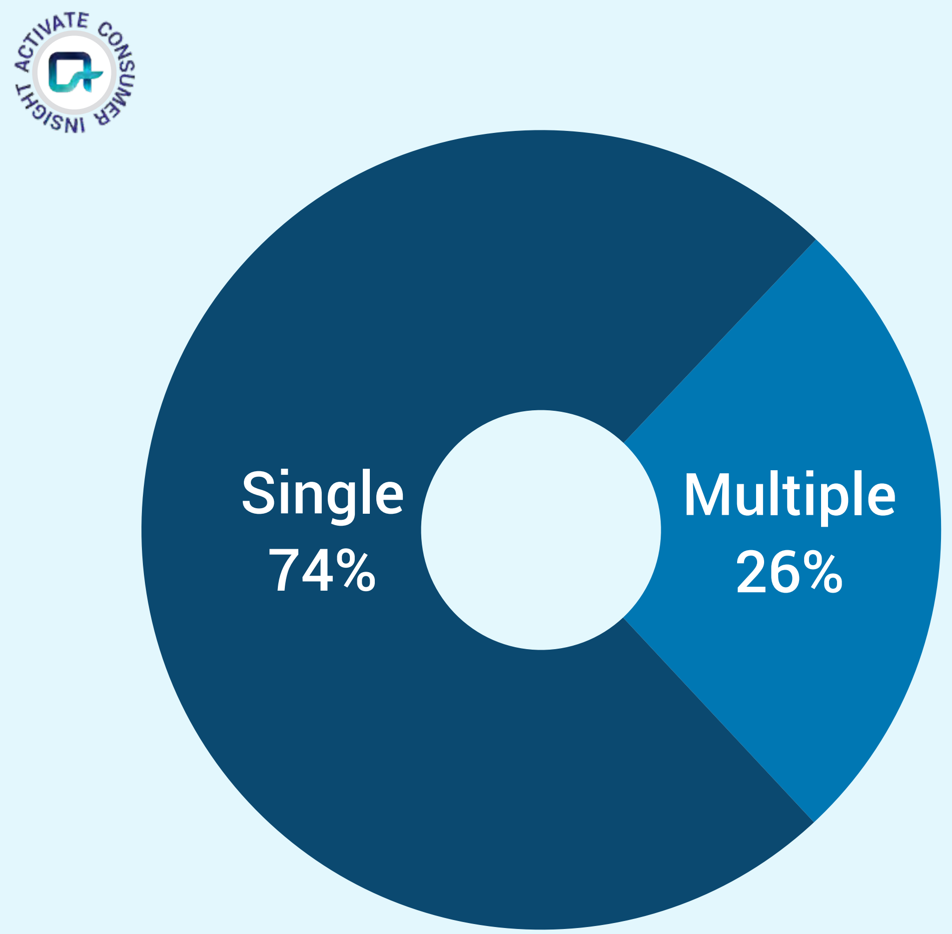
SMART SPEAKER INSTALL BASE BY MODEL, U.S., 2017, % OWNERS



1. Includes Kinect and other devices.
Sources: Activate analysis, Activate 2017 Consumer Tech & Media Research Study (Left: n=4,900; Right: n=820)

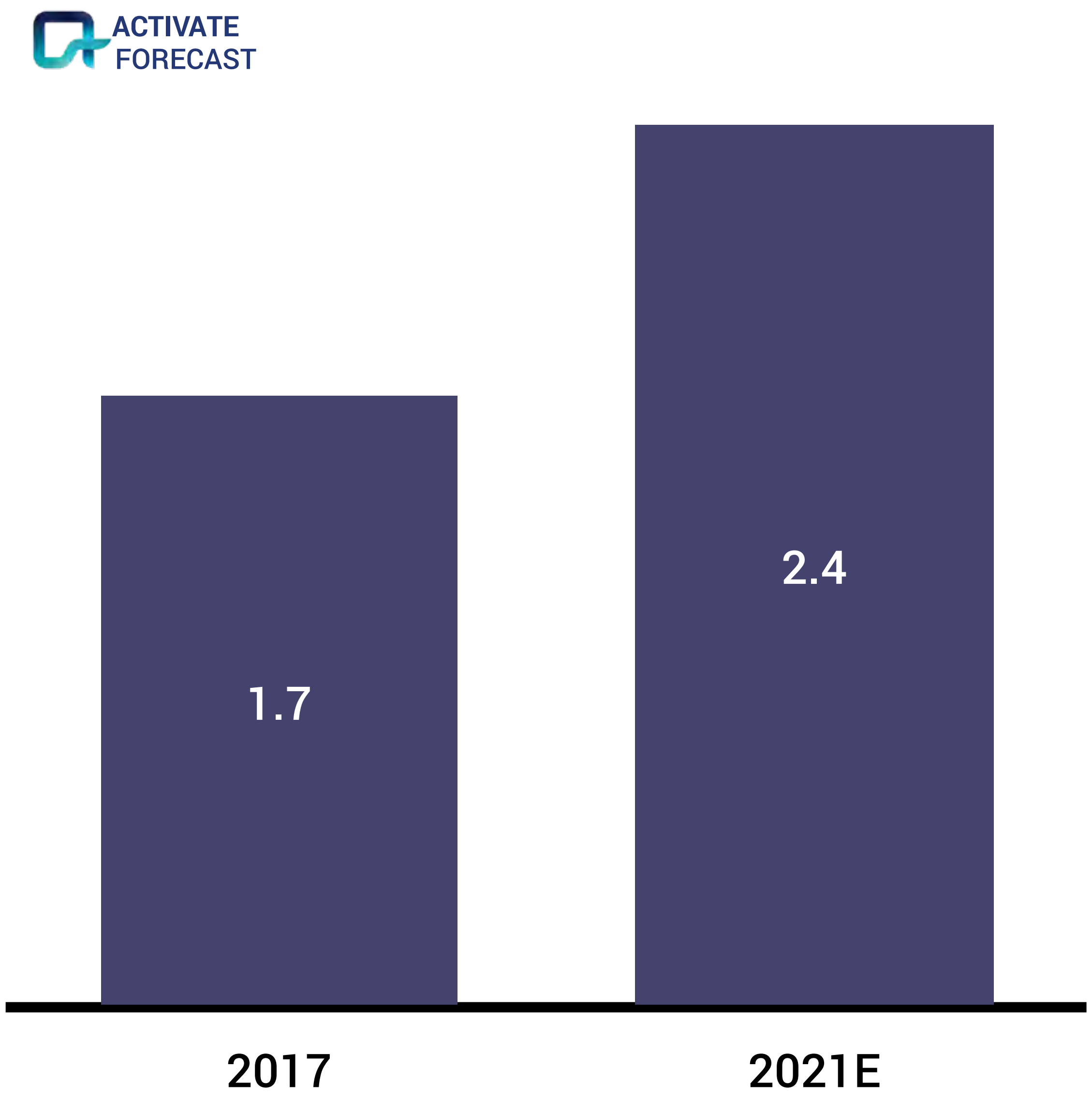
Already, over a quarter of existing smart speaker owners say that they are using more than one device; it is likely that the average U.S. 'Smart Speaker Household' will have 2.4 devices

NUMBER OF SMART SPEAKERS OWNED, U.S., 2017, % OWNERS



50% of owners of multiple smart speakers bought speakers to put in additional rooms

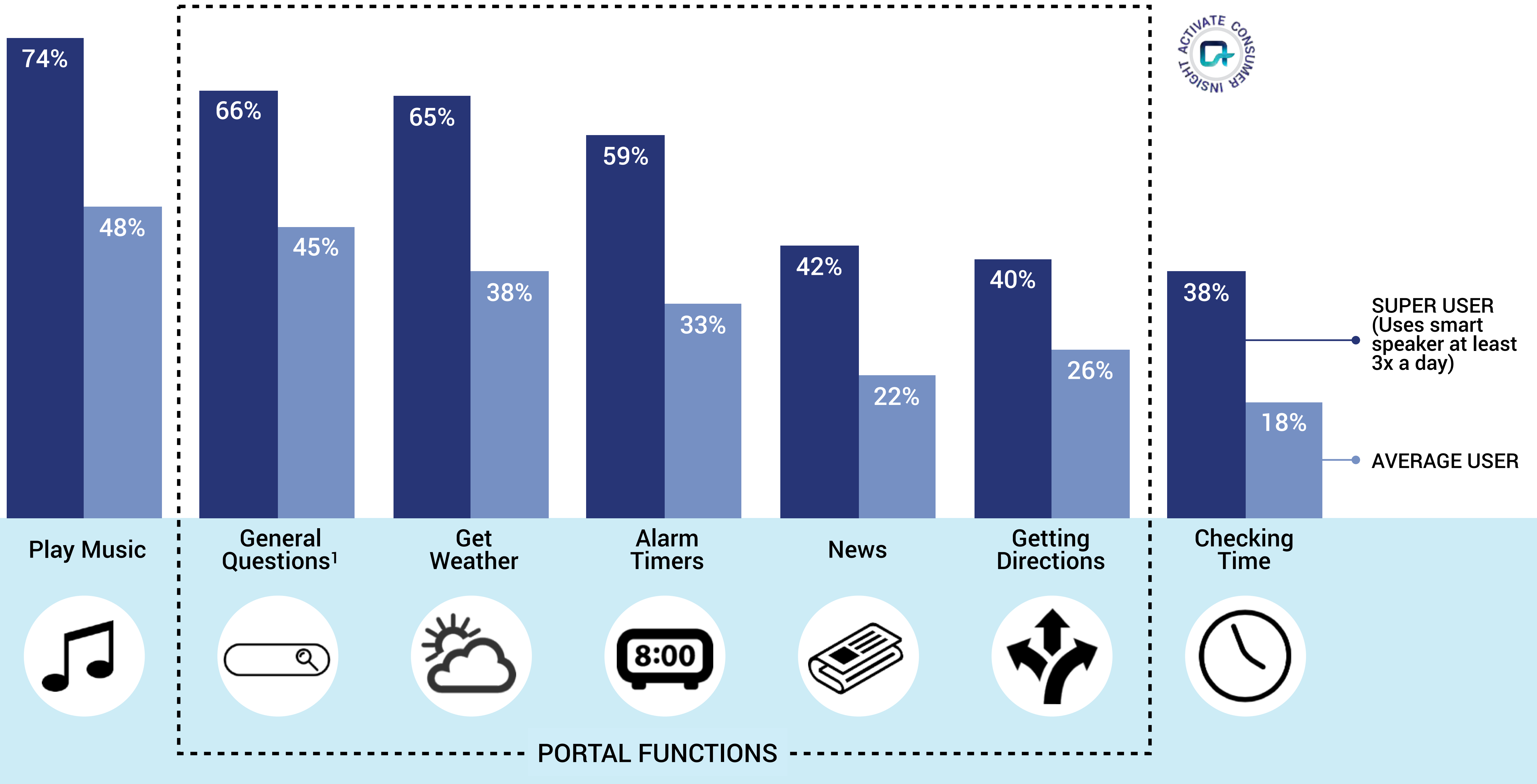
AVERAGE DEVICE PER SMART SPEAKER HOUSEHOLD, U.S., 2017-2021E



Sources: Activate analysis, Activate 2017 Consumer Tech & Media Research Study (n=820), U.S. Census Bureau

The majority of owners (even Super Users) primarily use smart speakers for music and a small set of 'portal functions'

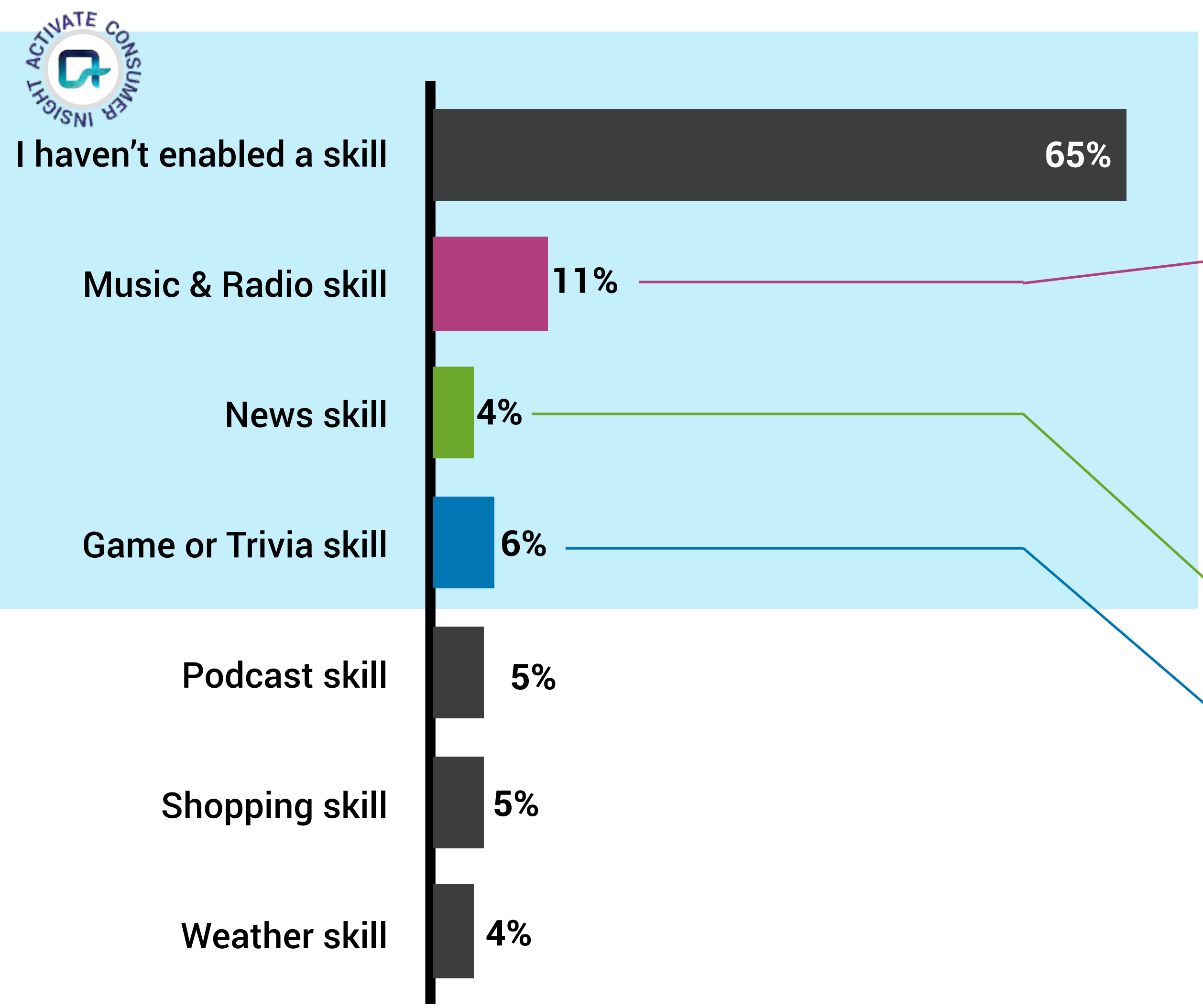
TOP WEEKLY USE CASES, U.S., 2017, % OWNERS



1. Excluding weather and news.
Sources: Activate analysis, Activate 2017 Consumer Tech & Media Research Study (n=820)

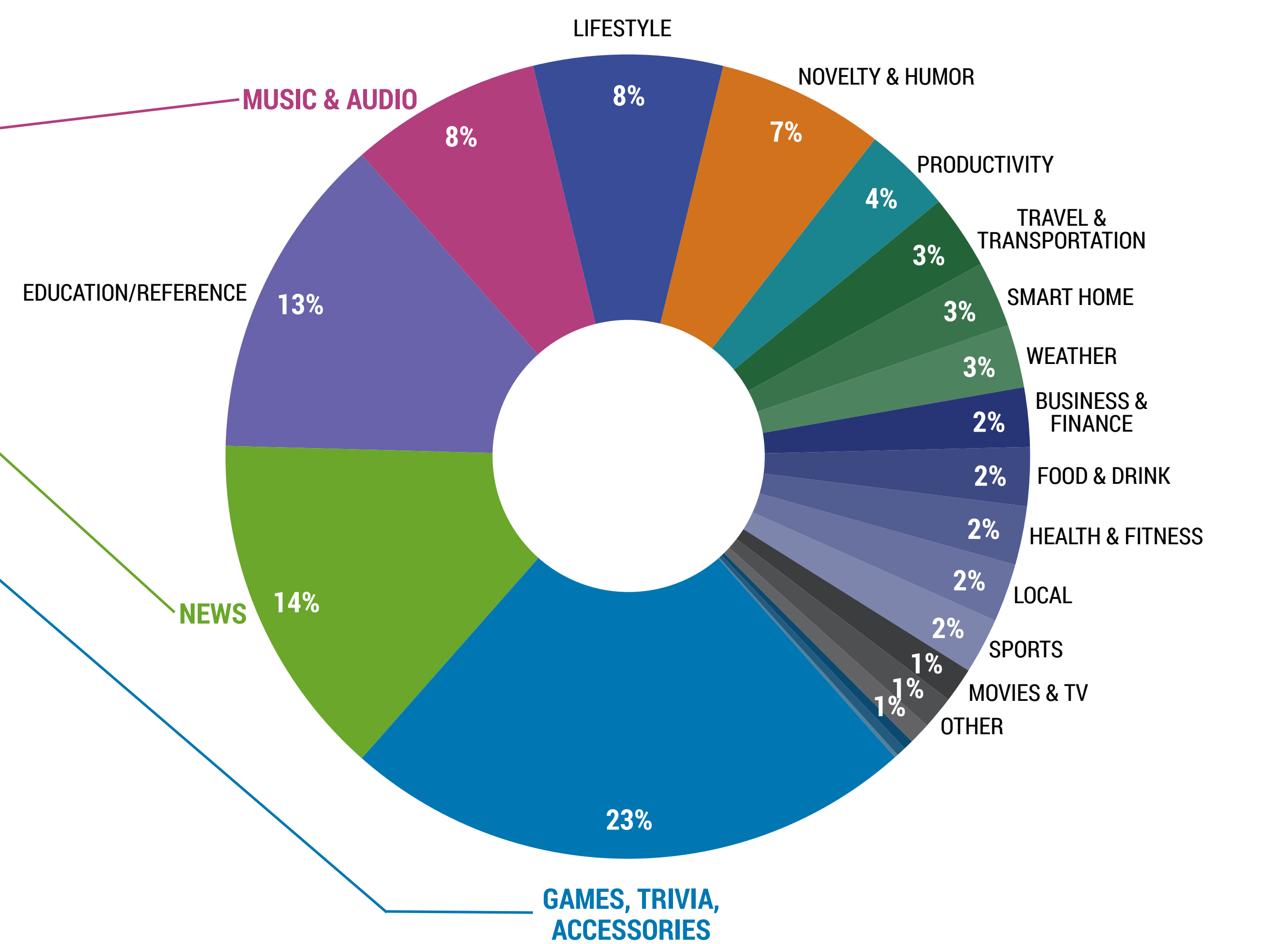
Our research shows that 65 percent of users have not yet enabled a third-party skill; today, skill discovery is difficult

ALEXA NEW SKILL ENABLEMENT BY OWNER, U.S., OCT 2017, % OWNERS



ALEXA SKILLS BY CATEGORY, OCT 2017, % TOTAL

25,000+ ALEXA SKILLS



Sources: Activate analysis, Activate 2017 Consumer Tech & Media Research Study (n=820), Amazon, Voicebot.ai

Skill usage is likely to be native to each user's device; "always listening" features will be baked into practically every major consumer electronics product

AREAS OF NATIVE INTEGRATION FOR DIGITAL ASSISTANT BEYOND THE SMART SPEAKER

TODAY

PERSONAL COMPUTERS

Lenovo Yoga 920

PCs now integrate field microphones for voice activation, which will likely become a standard feature on all computers

SMART ACCESSORIES

Bose QC35 II

Audio equipment manufacturers now preload Google Assistant onto smart headphones — demonstrating the trend of decoupling digital assistants from devices

MOBILE PHONES

Moto x4

Alexa is now available as the default voice assistant in a mobile device — competing with Google Assistant on its native platform

NEAR FUTURE

APPLIANCES

A number of home appliances currently work in conjunction with smart speakers, and OEMs will likely begin natively integrating digital assistants

TELEVISIONS

Digital assistants are currently available on TVs through OTT boxes and dongles, but deep integration of digital assistance will likely occur (including Bixby on Samsung TVs)

AUTOMOBILES

Automobile manufacturers currently integrate basic voice assistance and will likely go deeper with integration

Source: Activate analysis

What could change the rules of the game in digital assistants/ smart speakers?

POTENTIAL GAME CHANGERS

SECURITY BREACH	ACCELERATION OF AI	PLATFORM PORTABILITY	SCALING GLOBALLY	CROWD-SOURCED DATA	REGULATION
A scaled attack that hacks and releases user data and conversations captured through smart speakers could prove disastrous for voice assistance	Rapid advancements in voice technology, including improved recognition of intonation and voiceprint as a method of identification will greatly enhance the user experience	Google Assistant and Alexa are openly accessible to third-party developers and OEMs, who in turn have integrated and distributed these digital assistants across a wide range of devices	Reaching global scale and adoption will require expansion into growth markets (e.g. Alexa seeing faster growth in non-English speaking countries)	Open access to new and crowd-sourced data will greatly enhance the user experience, and could potentially level the playing field for assistants that are starved for data	Government regulation could place limits on platform control and potentially stifle expansion of voice assistance, similar to what has occurred with Google's antitrust case with the EU

Source: Activate analysis

The Most Important Insights for Tech and Media in 2018

There is a great deal of hype and confusion about Virtual Reality and Augmented Reality

Merged Reality
Transmogrified Reality
Immersive Computing
Extended Reality **Mediated Reality**
Immersive Devices Digital Reality
Diminished Reality **Mixed Reality**[1]
Mixed Reality Video
Hyper Reality **Cinematic Reality**
Holographic Computing
Augmented Virtuality
Spatial Computing
Holographic Devices
CG Virtual Reality
RV (Reality-Virtuality) Continuum

1. MR (Mixed Reality): sometimes used to refer to more “immersive” AR. However, this term has been defined inconsistently between different tech and media companies, recently even being used to describe VR.
Sources: Activate analysis, “Karl Guttag on Technology” blog, TechCrunch, The Verge

Reality Computing enables rich, immersive experiences that will lead to the next big computing platform

REALITY COMPUTING

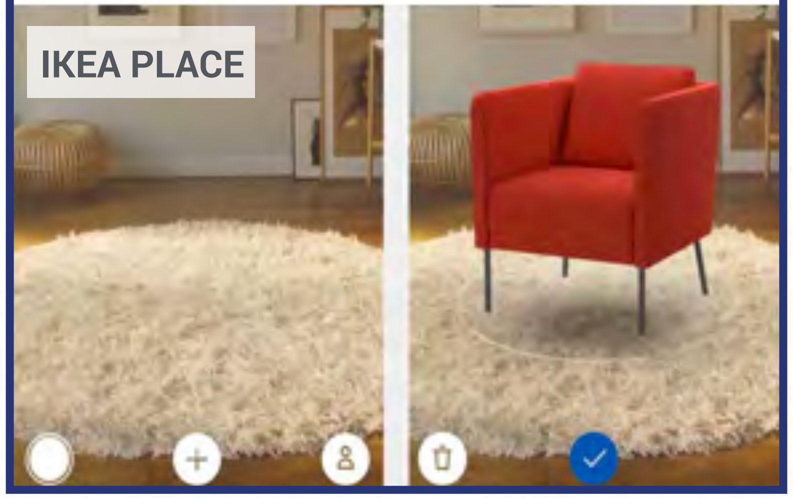
TODAY → TOMORROW

VR (VIRTUAL REALITY)

- Fully immerses user in a virtual or digital environment
- Allows users to explore imaginary worlds
- Enables interactive gaming
- Creates a new way of viewing 360-degree video and live events
- Renders 3D visual representations of places, people, and objects

AR (AUGMENTED REALITY)

- Digitally overlays visuals and information onto the physical world through spatial mapping
- Enhances the space by superimposing digital information and notifications
- Allows users to watch videos and play games directly in their field of view, without the need for a physical screen



THE NEXT BIG COMPUTING PLATFORM

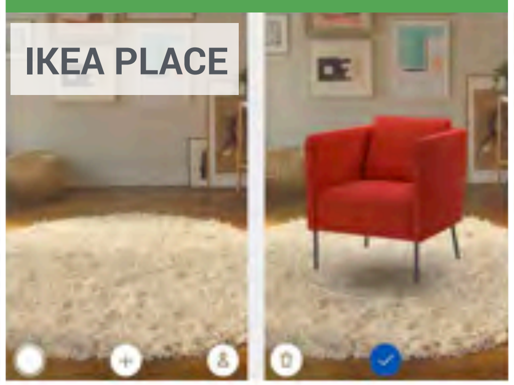
- Seamlessly integrates digital and physical worlds to enable new functionalities
- Guides decisions and actions through Artificial Intelligence (AI)/machine learning and data contextualization
- Integrates emerging technologies to create "everywhere screens," enhance collaboration, and augment enterprise capabilities across industries

Source: Activate analysis

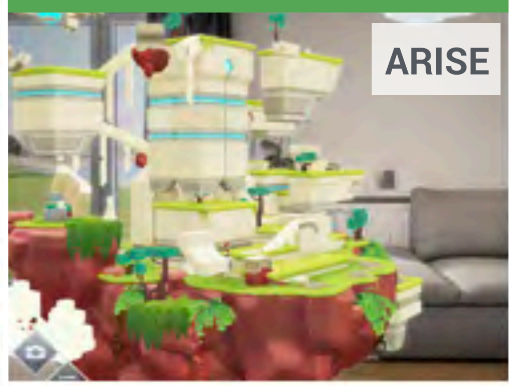
Reality Computing is primarily entertainment today, but will become the next big computing platform, incorporating sophisticated technology

REALITY COMPUTING TODAY
Primarily an entertainment experience

AT-HOME SHOPPING

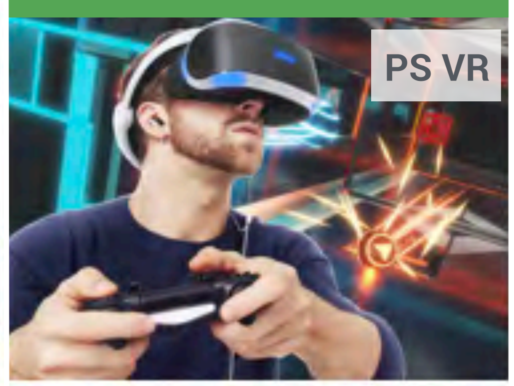


CASUAL GAMING



MESSAGING/SOCIAL

CONSOLE GAMING



REALITY COMPUTING TOMORROW
Incorporates emerging technology to become the next big computing platform

+ Spatial Mapping[1]

COLLABORATION

+ IoT Data[2]

TESTING/REPAIRS

+ 5G[3]

"EVERYWHERE SCREENS"

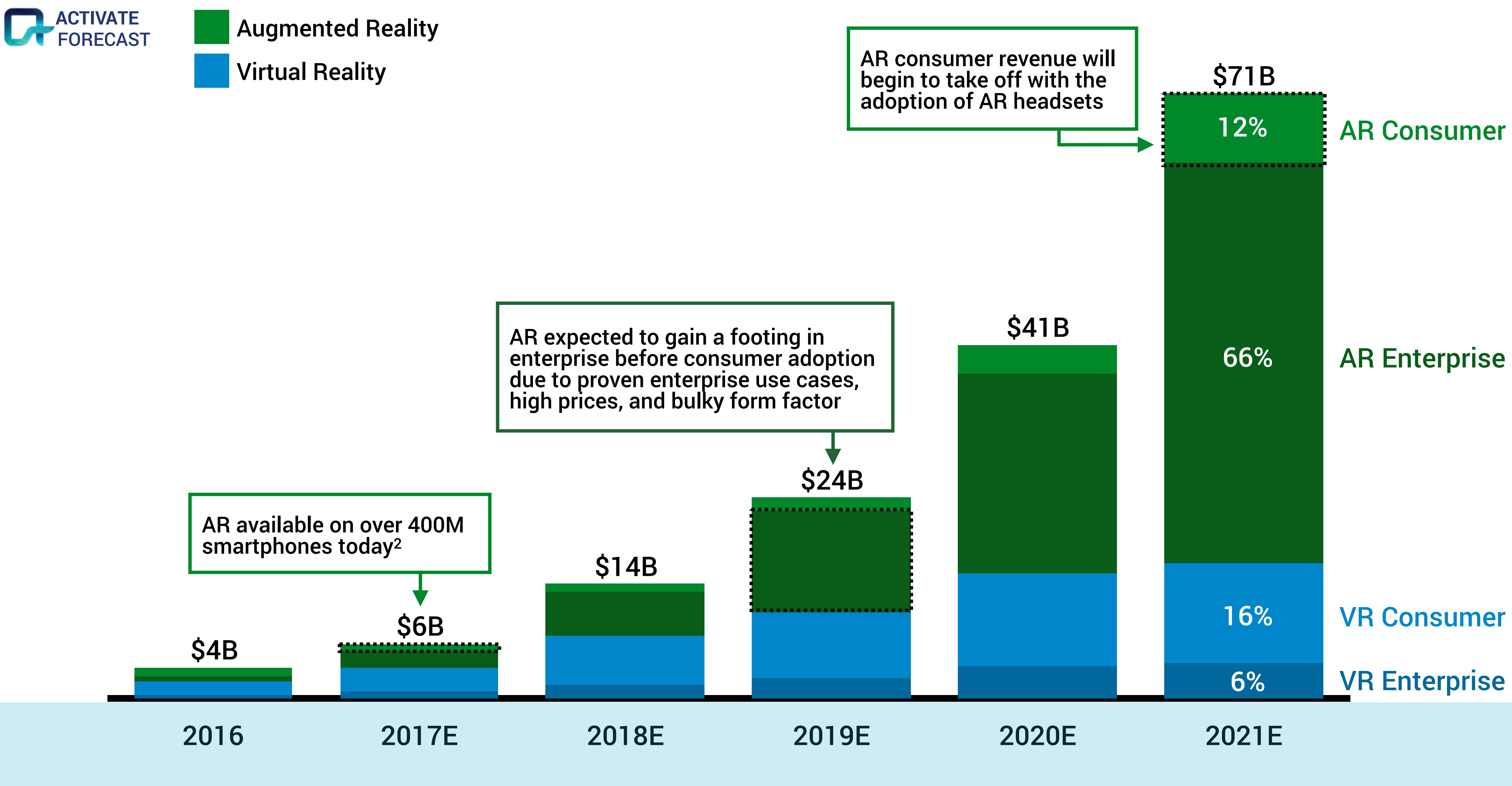
+ AI

VIRTUAL ASSISTANT

1. 6DoF (6 degrees of freedom, which includes x, y, z, roll, pitch, yaw) tracking enabled by SLAM (simultaneous location and mapping). 2. Internet of Things will provide contextual data on machines and appliances, enabling repairs and testing in enterprise settings as well as smart homes. 3. Increased bandwidth will enable multiple digital screens with simultaneous video and information without lag.
Sources: Activate analysis, "Karl Guttag on Technology" blog, TechCrunch, The Verge

We forecast that Reality Computing will be a $70 billion business by 2021

CONSUMER AND ENTERPRISE SPEND ON VR/AR[1], GLOBAL, 2016-2021E, BILLIONS



1. Excluding advertising revenues, government military spending, and head-up displays (e.g. Tesla dashboard). 2. Apps enabled by Apple's ARKit (iPhone 6s and later) and Google's ARCore (Galaxy S8, Pixel, and others expected in 2018).
Sources: Activate analysis, Amazon, Apple, Ars Technica, Canalys, Consumer Intelligence Research Partners, CNet, Credit Suisse, Digi-Capital, eMarketer, Gartner, Gizmodo, Goldman Sachs, Greenlight Insights, IDC, Merrill Lynch, SquareTrade, Strategy Analytics, Superdata, TechCrunch, U.S. Census, Venture Beat, Vgchartz, Wall Street Journal, ZDNet

Today, VR is an innovative media, information, and entertainment medium

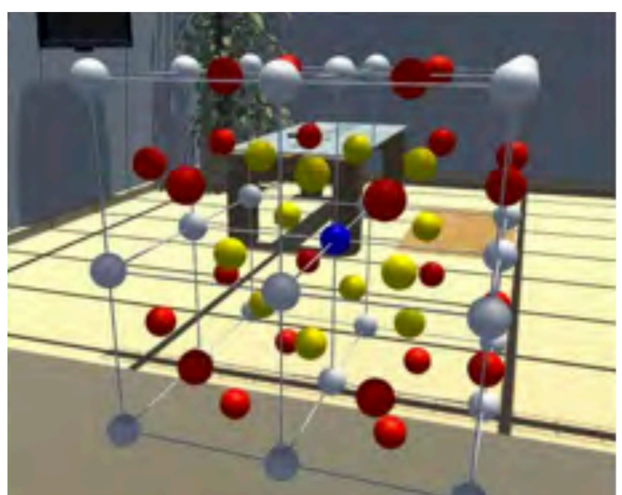
IMMERSIVE GAMING

MOVIES

CONCERTS

SPORTING EVENTS

NEWS



EDUCATION

TRAVEL

OUT-OF-HOME ATTRACTIONS

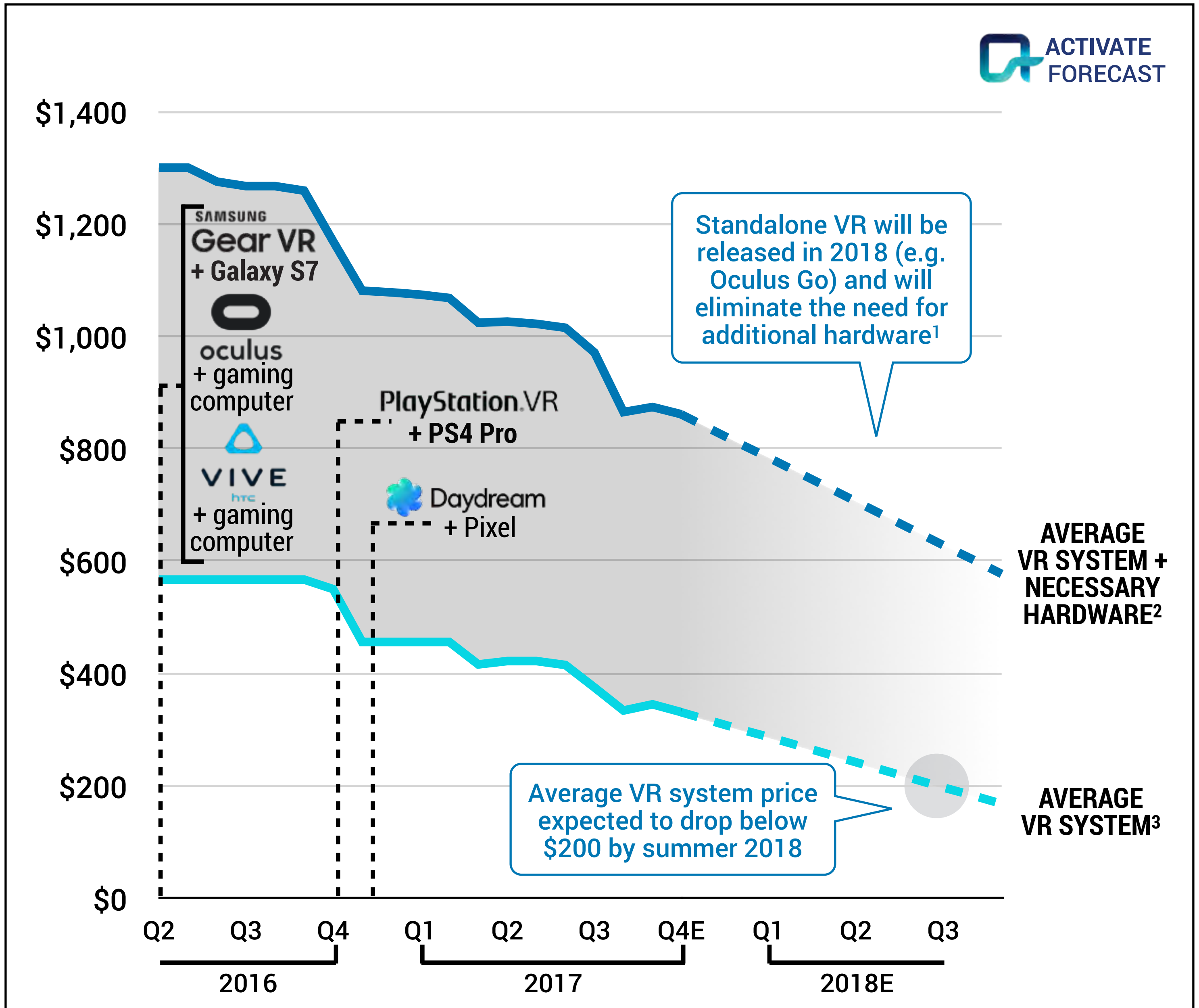
Media and entertainment companies have invested in VR to create new forms of experiential content

The New York Times	Launched the NYT VR app, allowing users to witness current events in a purely virtual environment
CBS	Transformed Netflix's "Stranger Things" into an Emmy-nominated Virtual Reality experience
hulu	Launched a Virtual Reality app for Samsung Gear VR, which allows subscribers to view exclusive, immersive content
Bethesda Game Studios	Will release Fallout, Doom, and Skyrim as Virtual Reality games for the PS VR
baobab	Creates animated Virtual Reality movies, including the Daytime Emmy-winning "Invasion!"
JAUNT	Enables VR storytelling through the creation of a VR-specific platform, original content, and a high quality VR camera
NEXTVR	Captures and streams live sporting events (e.g. NBA, NFL) and concerts, which are available on all VR devices
Wevr	Publishes its own and third-party content through its distribution platform Transport

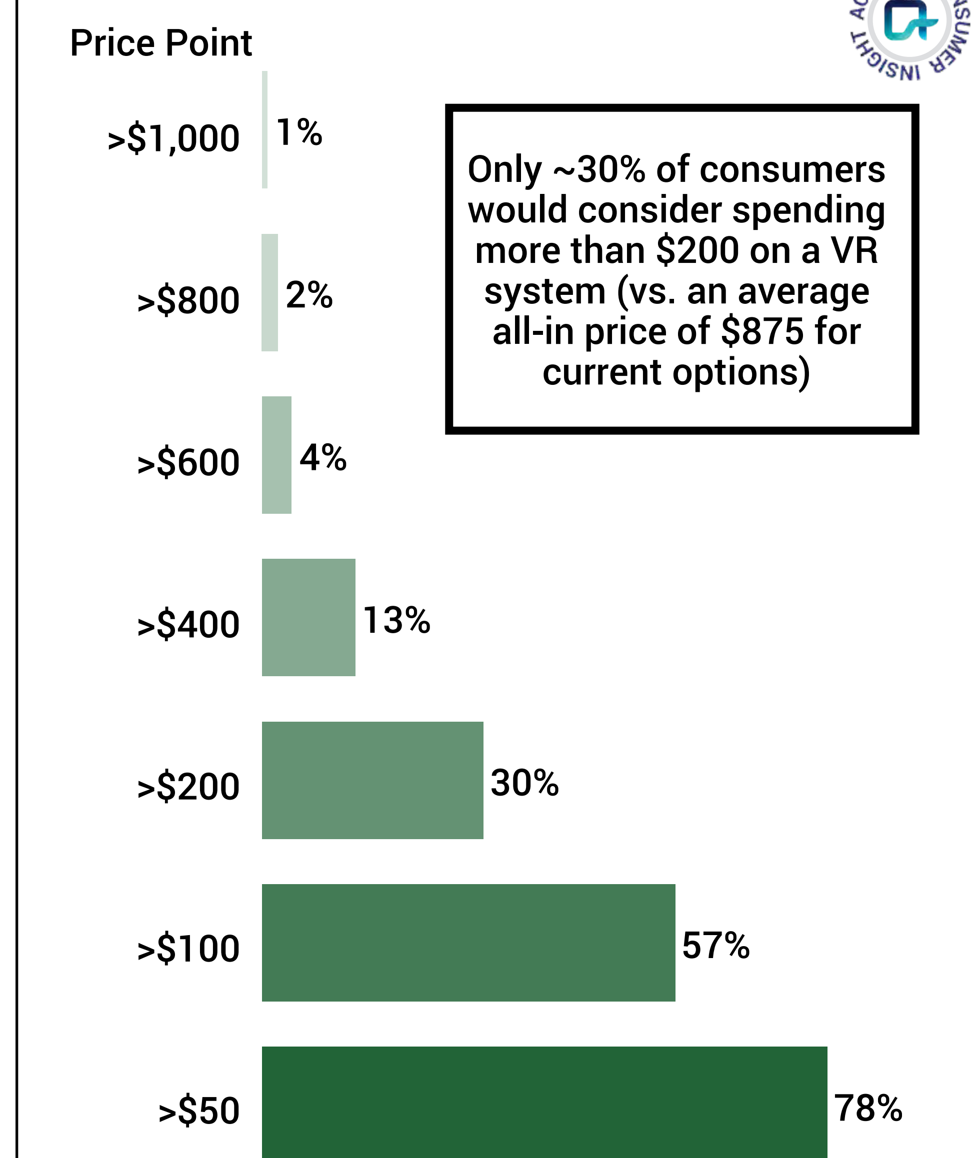
Sources: Activate analysis, CB Insights, CrunchBase, Fast Company, The Verge

VR device companies are lowering prices to reach larger audiences

AVERAGE PRICE OF VR, U.S., Q2 2016-Q3 2018E,



OF THOSE WHO HAVE TRIED VR, CUMULATIVE % WHO WOULD CONSIDER BUYING DEVICE TO ACCESS VR EXPERIENCE ABOVE GIVEN PRICE[4]

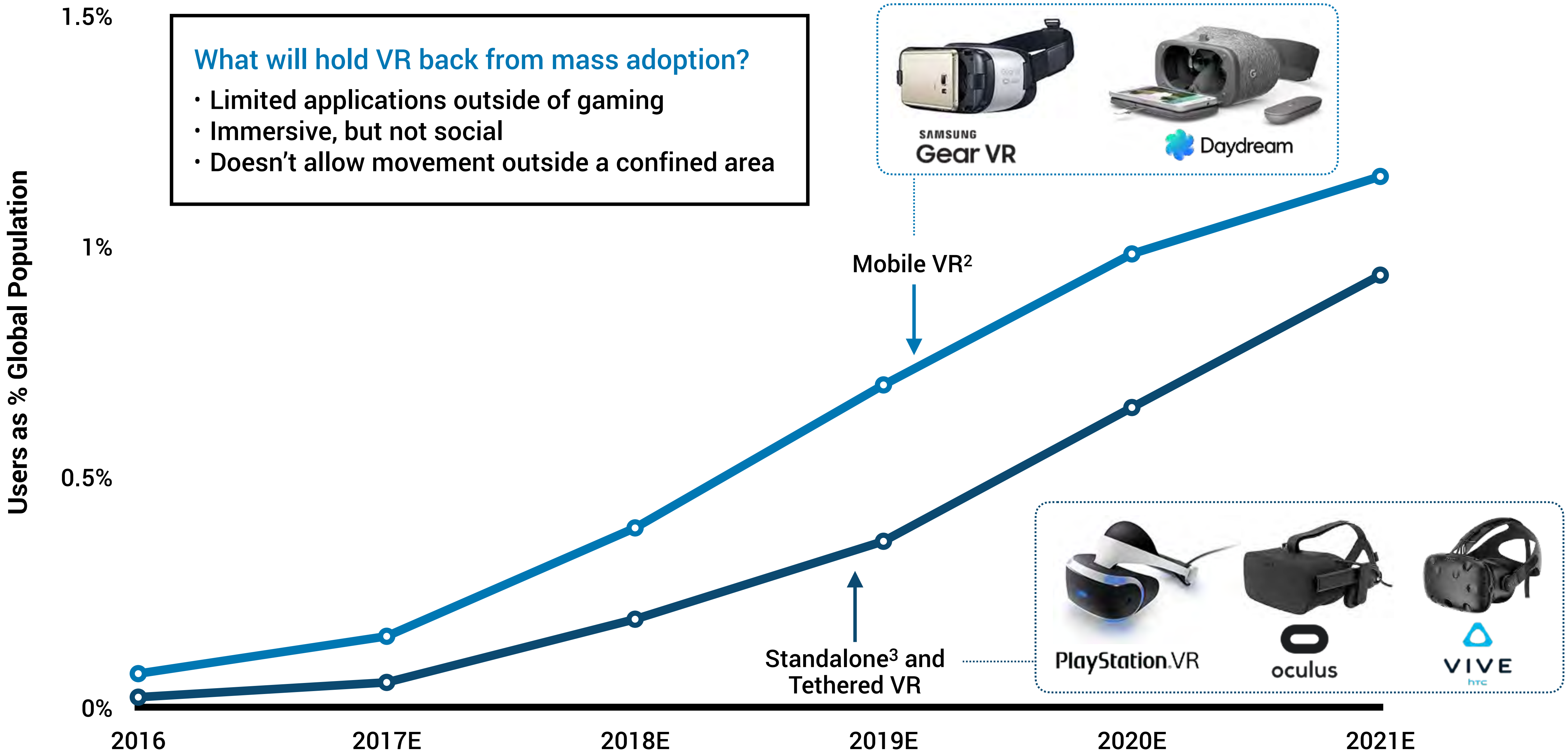


1. Standalone VR does not require a phone, computer, console, or any external sensors or wires. Announced by Vive and Oculus, and already exists in the form of Pico Goblin. 2. Includes VR system, plus: low-end compatible PC (Vive & Oculus); PS4 Pro (PS VR); Samsung Galaxy S7 (Gear VR); Pixel (Daydream View). 3. Includes HTC Vive, Oculus Rift, PS VR, Samsung Gear, and Google Daydream View, plus all required controllers and sensors. 4. Distribution of users who have tried VR; price includes any new hardware.
Sources: Activate analysis, Activate 2017 Consumer Tech & Media Research Study (n=210), Amazon.com, Google, Superdata, TechCrunch, UploadVR, Wall Street Journal

Nevertheless, we forecast that VR will not reach scaled global adoption

CONSUMER VR ADOPTION[1], GLOBAL, 2016-2021E, % POPULATION

ACTIVATE FORECAST



1. Modeled after 7th generation gaming consoles (Wii, PS3, Xbox 360, DS, and PSP). 2. Excludes Google Cardboard (and third-party cardboard viewers). Assumes some cannibalization from standalone VR as price drops in later years. 3. Standalone VR does not require a phone, computer, console, or any external sensors or wires.

Sources: Activate analysis, Amazon, Apple, Ars Technica, Canalys, Consumer Intelligence Research Partners, CNet, Credit Suisse, Digi-Capital, eMarketer, Gartner, Gizmodo, Goldman Sachs, Greenlight Insights, IDC, Merrill Lynch, SquareTrade, Strategy Analytics, Superdata, TechCrunch, U.S. Census, Venture Beat, Vgchartz, Wall Street Journal, ZDNet

Smartphones will make Augmented Reality accessible to large-scale customer bases

INSTANT USER BASE
Smartphones have a huge user base with relatively quick refresh cycles

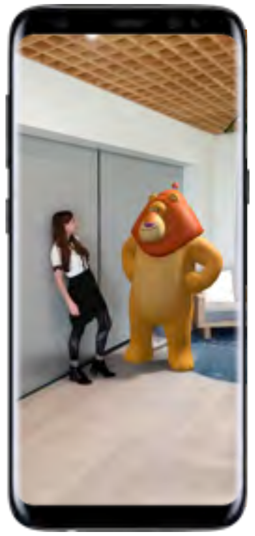
FREE HARDWARE
AR-optimized smartphones already have the required hardware for no additional cost to consumers

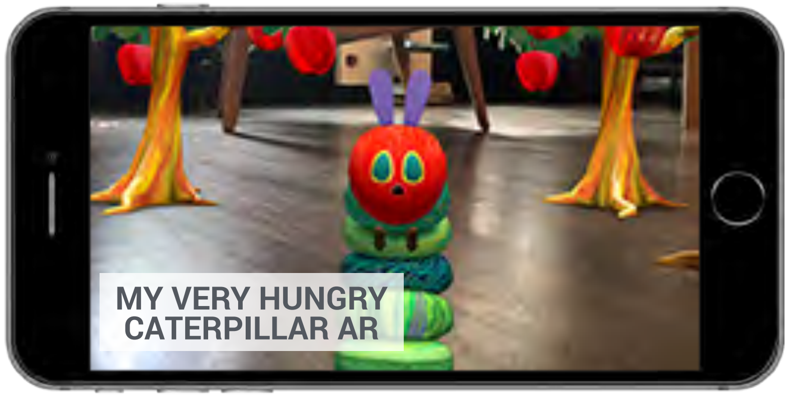
STANDARD TOOLKIT
Standard software development kits allow developers to use one tool to potentially reach billions

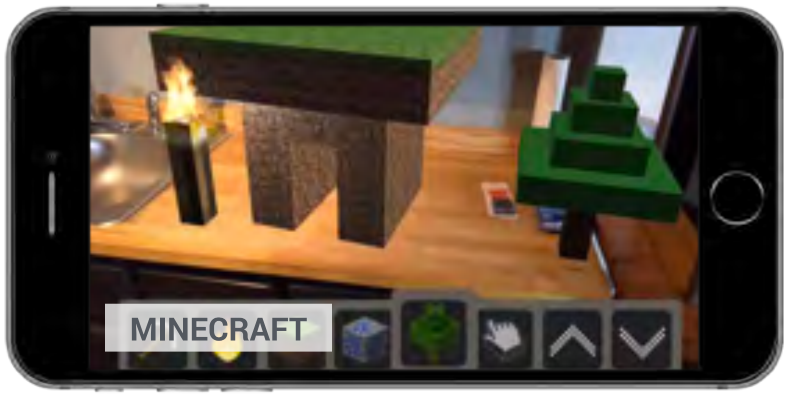
DEVELOPER COMMUNITY
A critical mass of developers can help establish techniques and best practices

Apple's ARKit currently enabled on iPhone 6s and later

Google's ARCore currently enabled on Galaxy S8 and Pixel phones

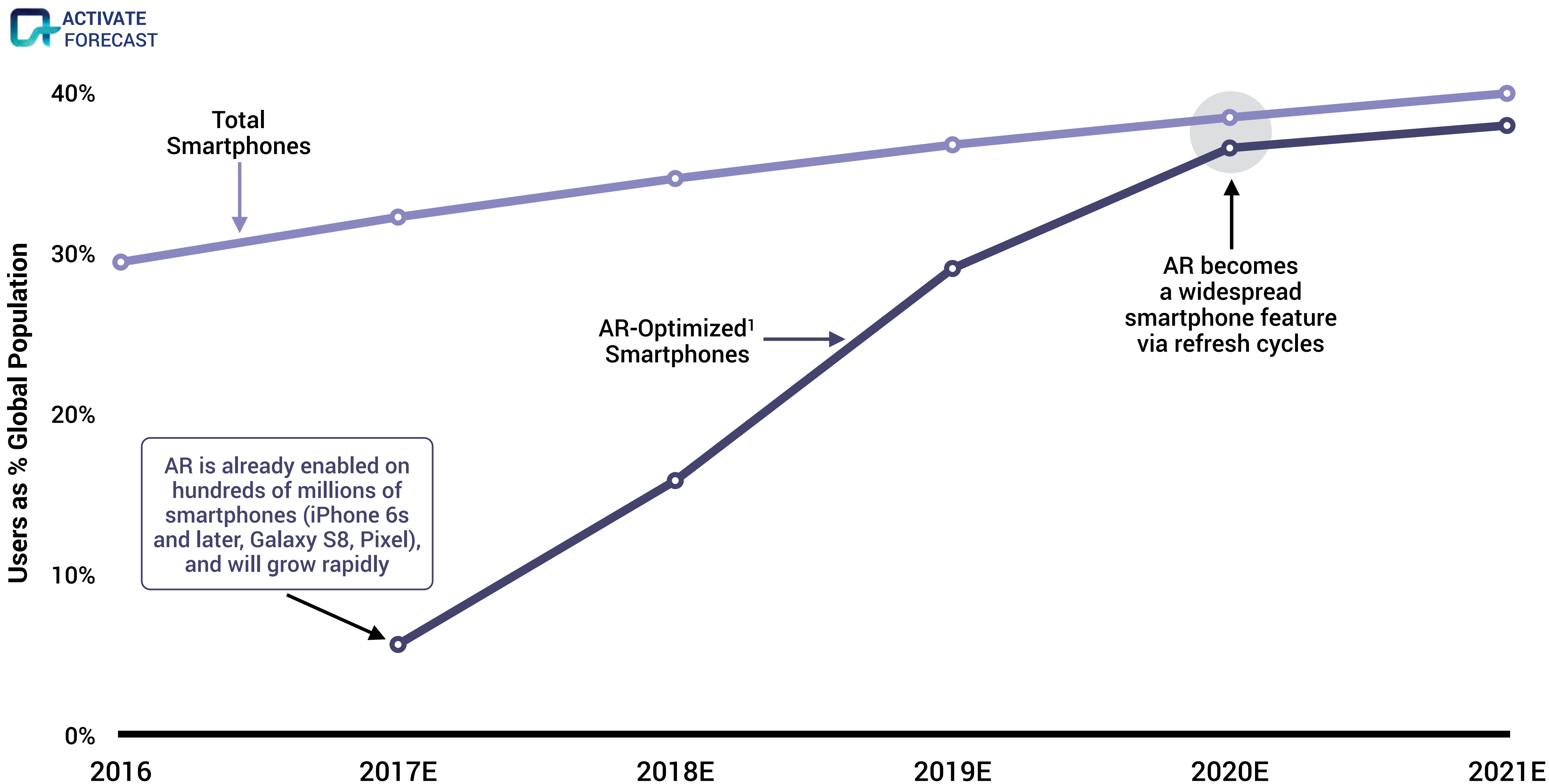






We forecast that AR will rapidly become a ubiquitous feature on smartphones, bringing Reality Computing to the mainstream

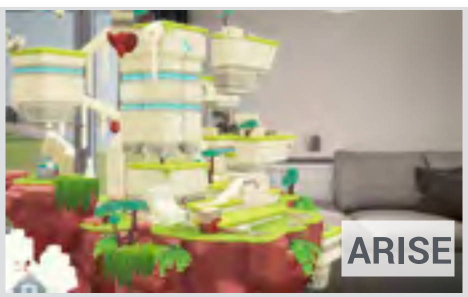
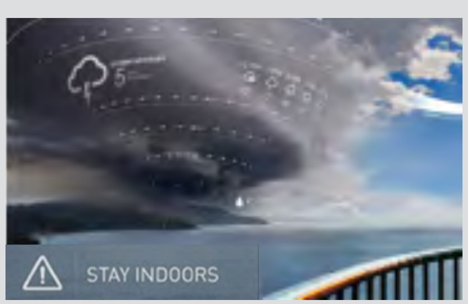
AR-OPTIMIZED SMARTPHONE AND TOTAL SMARTPHONE INSTALL BASE, GLOBAL, 2016-2021E, % POPULATION



1. Phone with 6DoF (6 degrees of freedom, which includes x, y, z, roll, pitch, yaw) tracking enabled by SLAM (simultaneous location and mapping). Requires carefully calibrated hardware and software.

Sources: Activate analysis, Amazon, Apple, Ars Technica, Canalys, Consumer Intelligence Research Partners, CNet, Credit Suisse, Digi-Capital, eMarketer, Gartner, Gizmodo, Goldman Sachs, Greenlight Insights, IDC, Merrill Lynch, SquareTrade, Strategy Analytics, Superdata, TechCrunch, U.S. Census, Venture Beat, Vgchartz, Wall Street Journal, ZDNet

AR will gain increasingly more sophisticated functionality enabling advanced enterprise and consumer applications

REALITY COMPUTING ROADMAP		DIFFERENTIATING FUNCTIONALITY	APPLICATIONS
	AR PROOF OF CONCEPT	• **Can overlay a 2D digital screen over viewing area** • GPS integration	• **Notifications** on head-up display • **Location pinning** via GPS
	AR ENTERTAINMENT	• **Tracking and mapping environment**[1, 2] • Facial recognition • Physics engines/light estimation	• **Games anchored in the real world** (e.g. Minecraft on a table) • Retail: digitally trying on clothes and placing furniture before purchase • Ability to apply filters to face
	ENTERPRISE SUPER WORKERS	• Significant increases **in reliability, durability, and accuracy** • **Headsets allowing free use of hands and larger field of view**	• **Enterprise applications** where overlaid content significantly enhances performance (e.g. **surgery, oil & gas fieldwork, assembly lines**)
	SOPHISTICATED COMPUTING PLATFORM	• **Usability improvements**: longer battery life, improved field of view **via consumer headsets** • **Integrating other technologies**: 5G, IoT, data contextualization via AI • **Lower price and improved form factor**	• Consumer-specific applications: **communication**, **navigation**, **fitness**, real-time health diagnostics, etc. • **Multiple virtual screens** that can be overlaid on any surface • **Intuitive 3D data modeling** (e.g. weather, traffic)

1. 6DoF (6 degrees of freedom, which includes x, y, z, roll, pitch, yaw) tracking enabled by SLAM (simultaneous location and mapping). 2. Pokémon Go originally did not map environment, but used GPS as a rough approximation. App has recently announced plans to use ARKit to map environment.
Sources: Activate analysis, "Karl Guttag on Technology" blog, TechCrunch, The Verge

AR applications will move beyond the smartphone and become more sophisticated through headsets, starting with enterprise

ENTERPRISE-GRADE AR HEADSETS WILL ARRIVE FIRST
(Prices as of Oct 2017)

ODG R-7

Price: $2,750

MICROSOFT HOLOLENS

Price: $3,000

META 2

Price: $1,495

DAQRI SMART GLASSES

Price: $4,995

CONSUMERS WILL TAKE LONGER TO ADOPT AR HEADSETS DUE TO THE FOLLOWING:

USE CASES
AR headset applications are already proven in enterprise, which will facilitate the technology's development

PRICE
With prices exceeding $2,000, AR headsets are too expensive for the average consumer

FORM FACTOR
Consumers are unlikely to wear bulky, heavy, and unsightly headgear in public

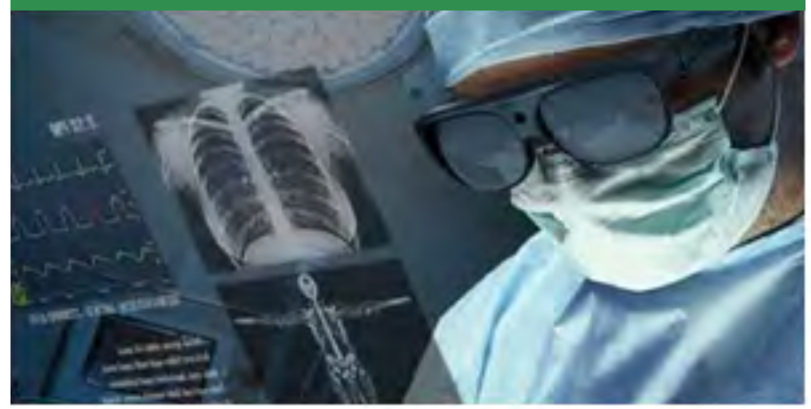
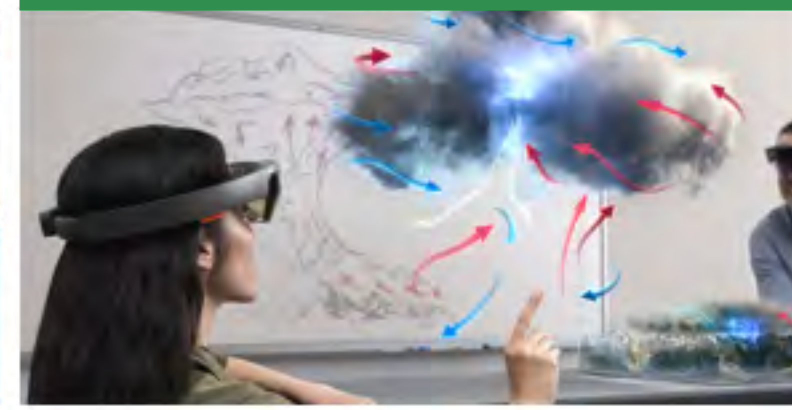
TECH CONSIDERATIONS
Consumer adoption will require longer battery life, larger viewing area, and greater mobility than enterprise[1]

1. Other factors include resolution, 2D vs. 3D, digital image brightness, local spatial mapping and tracking, heat dissipation, mobility, durability, peripheral vision, rendering speed, eye box size, multiple focal planes, color accuracy (rendering black, contrast, chromatic aberrations, etc.), and how dark the outside world appears. Companies are investing to address technical challenges for AR. Developments in chips, batteries, and 5G connectivity will also advance development.
Sources: Activate analysis, DAQRI, "Karl Guttag on Technology" blog, Meta, Microsoft, ODG, Virtual Reality Pop

Enterprise-grade AR will augment expertise, improve workflow, and enhance worker collaboration

ACTIVATE FORECAST

SELECTED AR ENTERPRISE APPLICATIONS[1]

OIL & GAS	HEALTHCARE	HIGHER EDUCATION
		

ADDRESSABLE AR MARKET BY SECTOR[1], GLOBAL, 2021E, BILLIONS USD

OIL & GAS	HEALTHCARE	HIGHER EDUCATION
$5-7B	$7-9B	$1-2B
Facilitate the installation and maintenance of industrial machinery, and assist engineers with operating and repairing equipment	Aid surgeons with precise overlays, give physicians readily viewable patient information, and allow paramedics to monitor vitals hands-free	Allow students to contextualize complex information, dissect virtual cadavers, and visualize 3D mathematical models

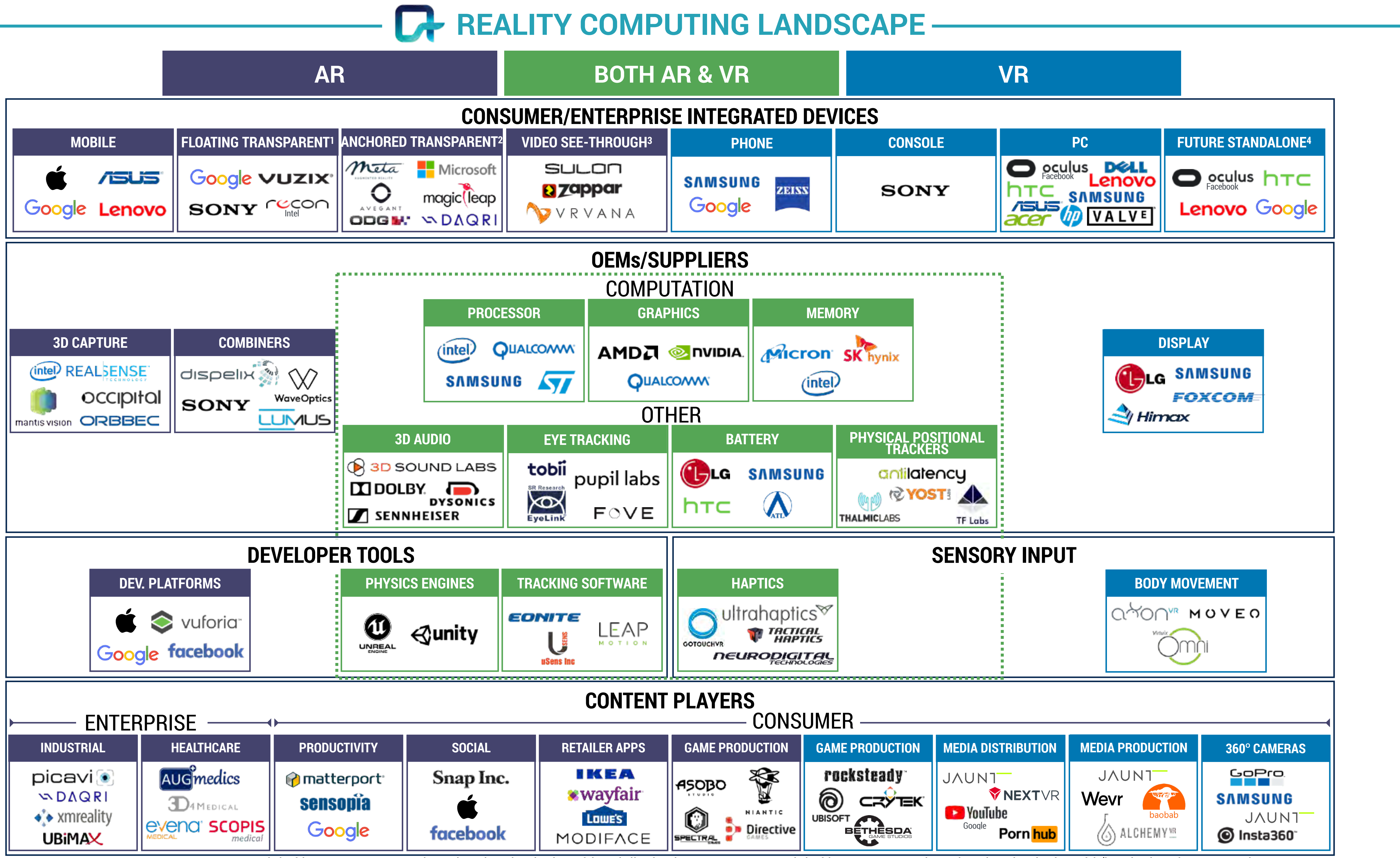
1. Three major, early applications listed as examples. Other industries likely to be impacted include, but are not limited to, construction, manufacturing, engineering, architecture, retail, data science, real estate, defense contracting, marketing, and advertising.
Sources: Activate analysis, American Petroleum Institute, Apple, BBC Research, Bureau of Labor Statistics, Council of Economic Advisers , IHS, International Trade Administration, Kaiser Family Foundation, OECD.com, Redi-Data, Reuters, SIIA, TechCrunch, UN Comtrade

The tech players' Reality Computing battle goes beyond phones – it is about the software to power future computing applications

	DEVELOPMENT OF ACTIVE USER BASE	BATTLE TO ESTABLISH THE DOMINANT COMPUTING PLATFORM	UPCOMING HARDWARE BATTLE
	SMARTPHONE DEVICES	SOFTWARE DEVELOPMENT KIT	AR HEADSETS
Apple	✓ (ARKit works on all iPhones from 6s onwards)	✓ (ARKit - 2017)	? (Speculation, but no product)
Google	✓ (ARCore currently optimized for Pixel and Galaxy S8)	✓ (Tango - 2014[1], ARCore - 2017 - expected for >100M Android phones by Q1 2018)	✓ (Launched Google Glass in 2013, led $542 million investment in Magic Leap in 2014)
Microsoft	-	✓ (Windows Mixed Reality - 2015, Xamarin[2] allows coders to write apps native to iOS, Android, and Windows, and now supports HoloLens)	✓ (On 3rd[3] iteration of HoloLens, considered one of the most advanced headsets)
facebook	-	✓ (AR Studio[4] - 2017)	? (Announced plans, but no product)
snapchat	-	? (Snap could create an SDK, but is currently not open to developers)	? (Spectacles: no AR capabilities, only camera and connectivity - could help future adoption)
amazon	-	-	? ("Smart Glasses" expected, but without AR component, only bone conduction audio and Alexa)

1. But not commercially available until 2017, and then only on Lenovo Phab 2 Pro and Asus ZenFone AR.
2. Acquired by Microsoft in February 2016. 3. Skipped 2nd iteration to focus on 3rd. 4. Part of Camera Effects Platform.
Sources: Activate analysis, Apple, Ars Technica, Facebook, Google, Microsoft, QZ, The Verge

The winners in Reality Computing are far from decided – players will emerge to fill new opportunities



1. Digital images are not anchored to the physical world and display is transparent. 2. Digital images are anchored to the physical world (i.e. the headset recognizes surfaces and distances accurately). 3. Physical world is recorded via camera and the feed and digital images are shown via an opaque screen. 4. Standalone VR does not require a phone, computer, console, or any other separate hardware or wires. Expected 2018 release.

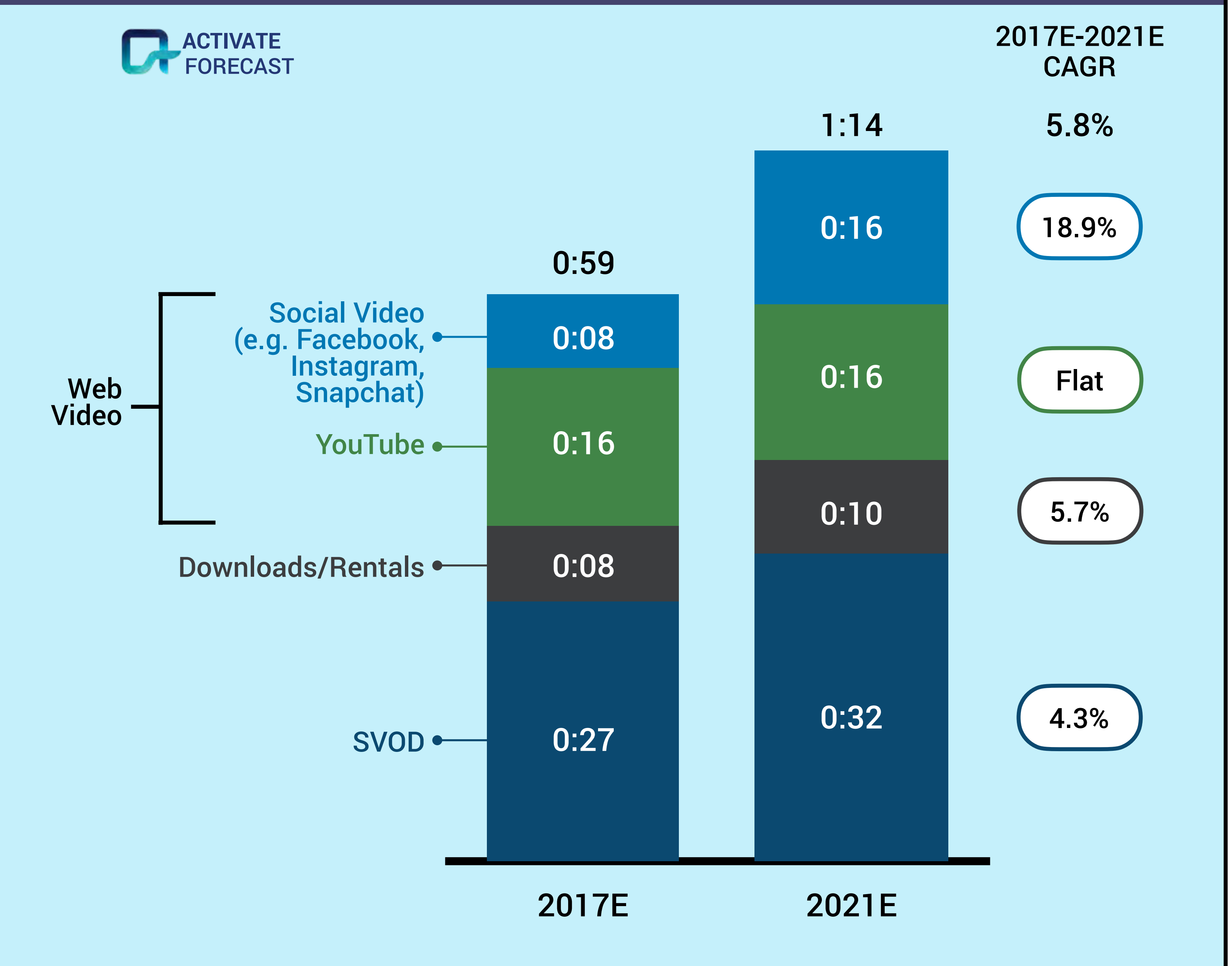
Sources: Activate analysis, CBInsights, Goldman Sachs, The Information, "Karl Guttag on Technology" blog, Merrill Lynch, The VR Fund

activate

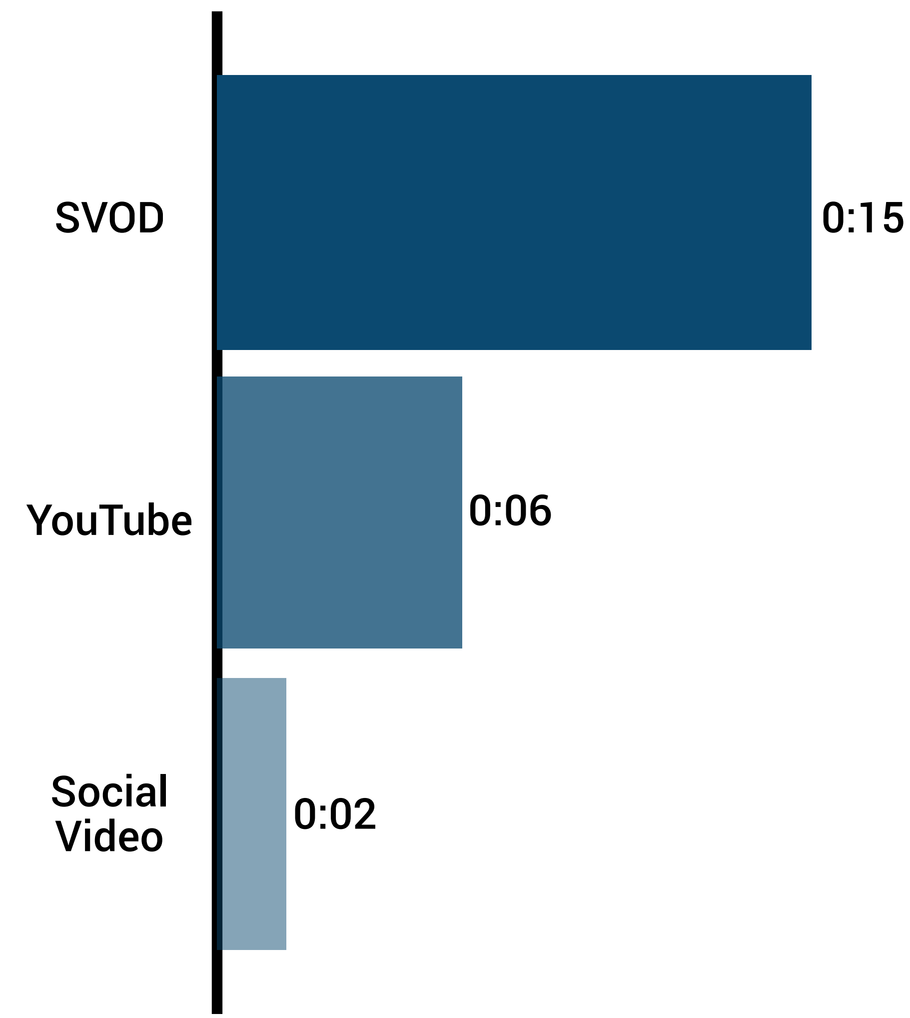
The Most Important Insights for Tech and Media in 2018

Overall, consumers will dramatically increase their time spent watching digital video

DAILY DIGITAL VIDEO TIME SPEND, U.S., **2017E-2021E,** HOURS:MINUTES[1]



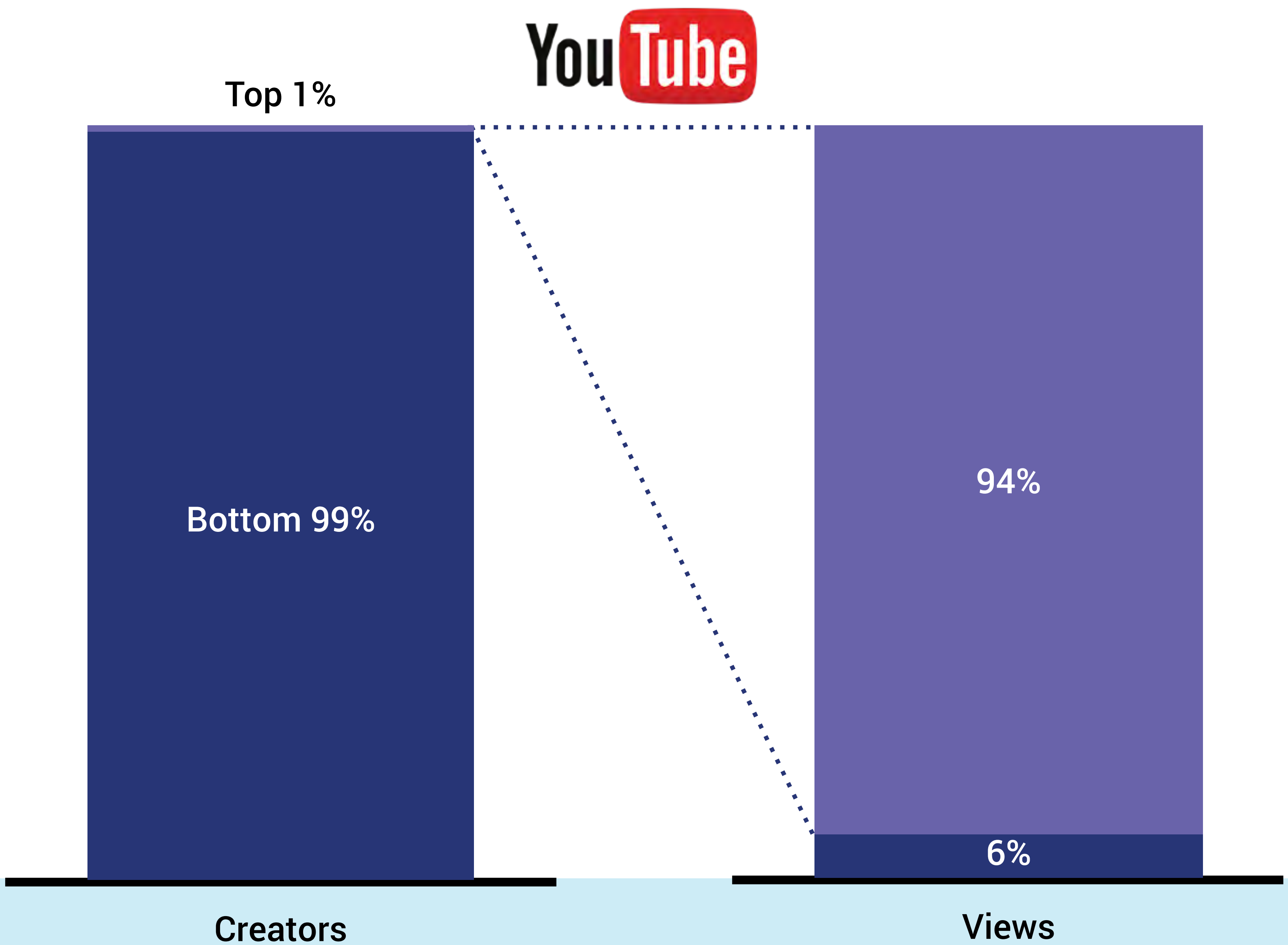
AVERAGE TIME SPENT PER VISIT BY PLATFORM, U.S., 2017E, HOURS:MINUTES



1. Among U.S. population.
Sources: Activate analysis, Business Insider, Cisco, Company press releases, eMarketer, MediaKix, Netflix, Sandvine, Sensor Tower

A small percent of creators drive the majority of views on YouTube

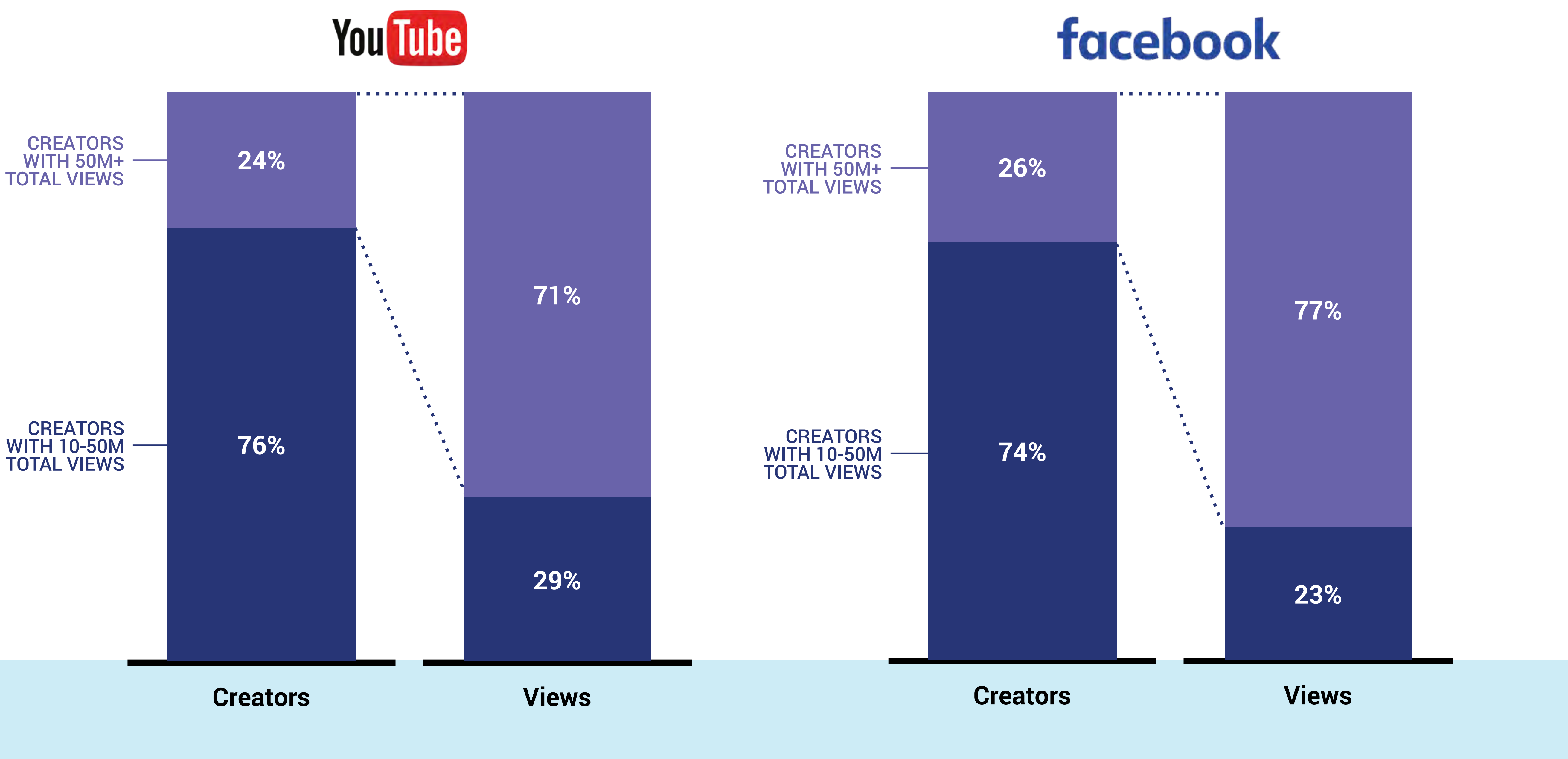
SHARE OF YOUTUBE CREATORS[1] VS. SHARE OF VIEWS, GLOBAL, Q1 2016, % CREATORS, VIEWS



1. Every YouTube channel is considered a unique creator.
Sources: Activate analysis, AllianceBernstein

Evaluating extensive Tubular Labs data on creators with over 10M views, approximately 25 percent of the creators account for over 70 percent of views

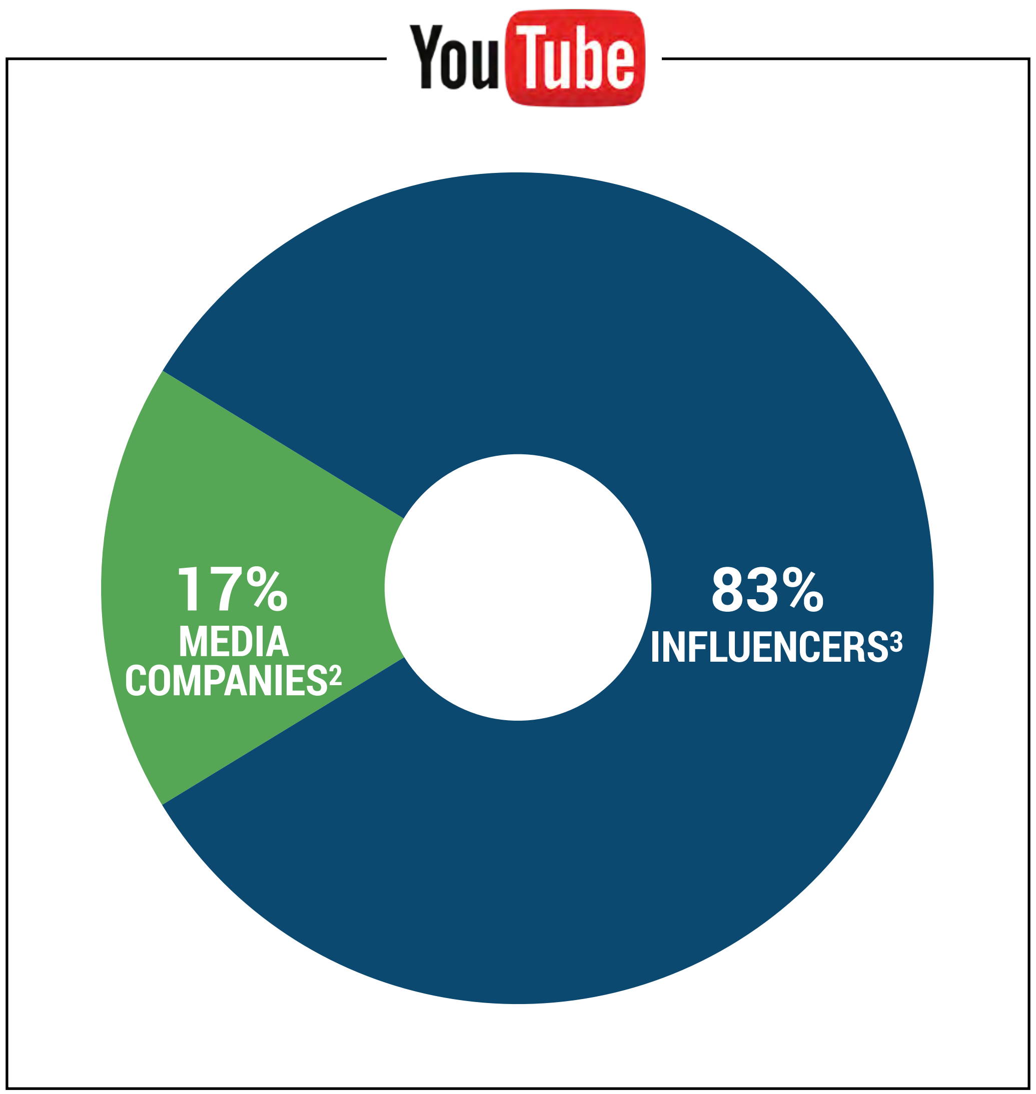
SHARE OF TOP[1] YOUTUBE AND FACEBOOK CREATORS VS. SHARE OF VIEWS BY PLATFORM, GLOBAL, Q2 2017, % TOTAL

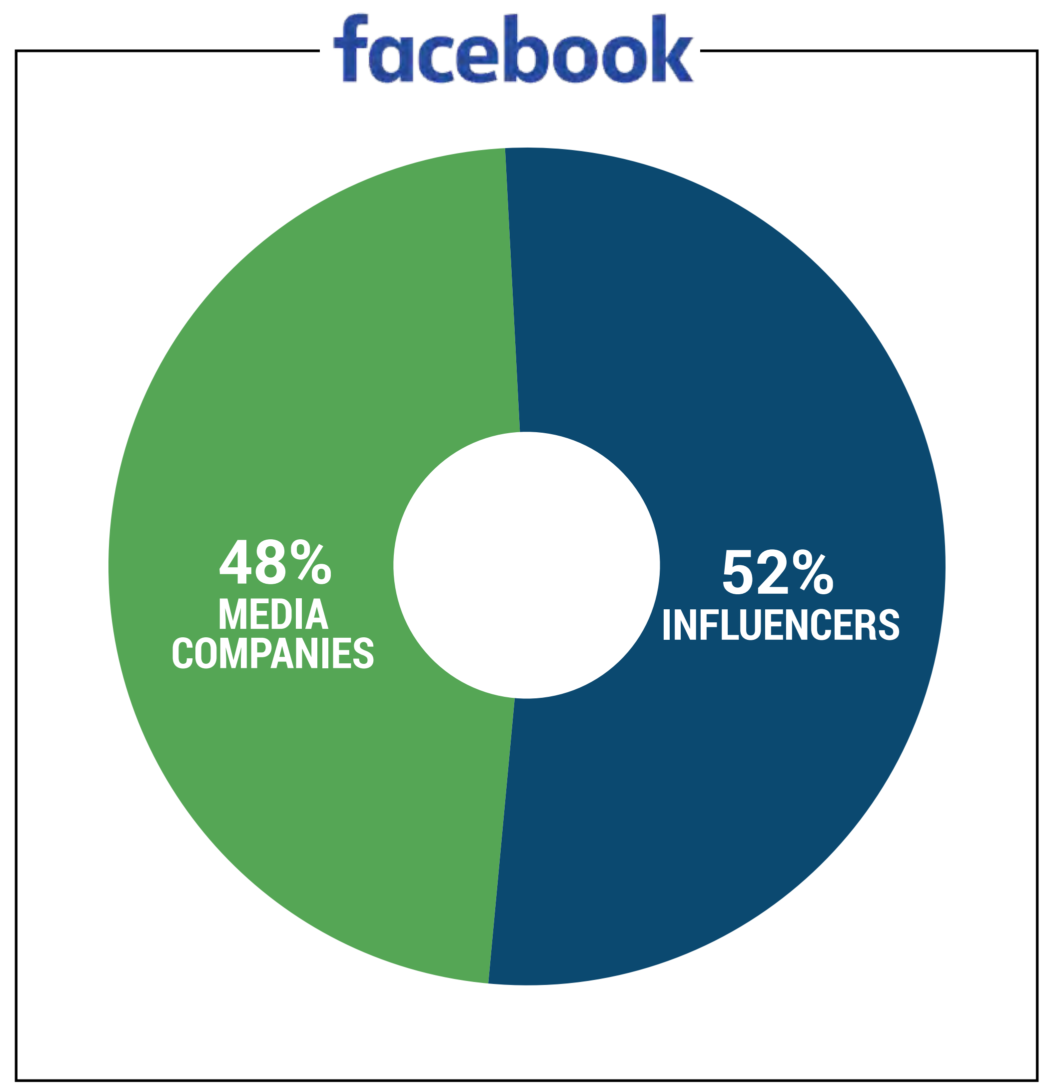


1. Top creators defined as those with over 10M total views.
Sources: Activate analysis, Tubular Labs

The web video head is primarily influencers and media companies; Tubular Labs data shows that there is a greater ratio of influencers to media companies on YouTube and a roughly even ratio on Facebook

SHARE OF VIEWS FROM TOP CREATORS[1] BY PLATFORM, GLOBAL**, Q2 2017, % TOTAL**





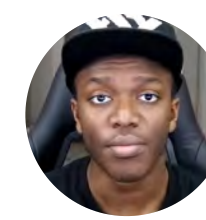
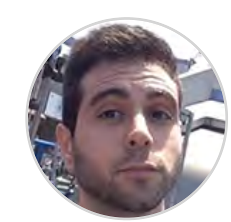
1. Top creators defined as those with over 50M total views. Influencers and media companies make up 97% of YouTube views in this group and 98% of Facebook views in this group, brands make up 3% in each.
2. Media companies defined as organizations whose primary business model is in production and/or distribution of content. Includes some professional influencer entities that have moved upstream.
3. Influencers defined as personalities, celebrities or public figures with significant social presence.

Sources: Activate analysis, Tubular Labs

Top web video influencers range across content areas and platforms

TOP YOUTUBE INFLUENCERS BY CATEGORY, GLOBAL, **OCT 2017, MILLION SUBSCRIBERS**

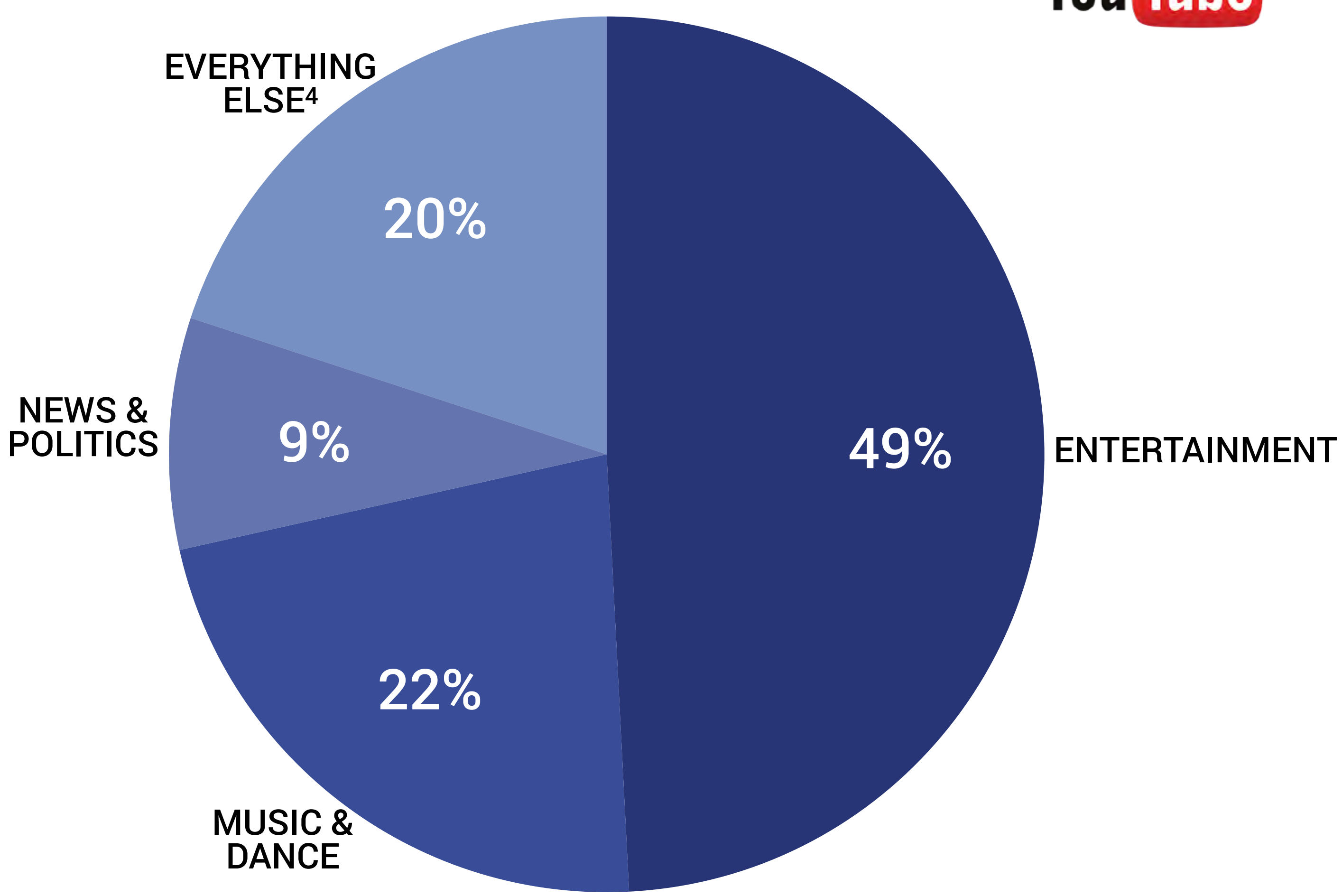
Combined, these influencers have over 70 billion views on YouTube

Category	Influencer	YouTube	Other platform	
HOW-TO & STYLE	YUYA	19.4	Instagram 10.0	
HOW-TO & STYLE	WEREVERTUMORRO	14.0	Facebook 22.0	
HOW-TO & STYLE	ZOELLA	12.0	Instagram 11.2	
HOW-TO & STYLE	BETHANY MOTA	10.5	Instagram 5.6	
HOW-TO & STYLE	ROSANNA PANSINO	10.5	Instagram 3.0	
PEOPLE & BLOGS	ROMAN ATWOOD	13.7	Instagram 5.6	
PEOPLE & BLOGS	JAKE PAUL	11.2	Instagram 9.8	
PEOPLE & BLOGS	SHANE DAWSON	10.8	Instagram 5.0	
PEOPLE & BLOGS	BF VS GF	9.4	Instagram 2.2 (Jesse Wellens)	
PEOPLE & BLOGS	COMEDY SHORTS GAMER	8.6	Instagram 1.9	
COMEDY & ENTERTAINMENT	HOLASOYGERMAN	32.5	Facebook 16.0	
COMEDY & ENTERTAINMENT	WHINDERSSONNUNES	23.9	Instagram 14.9	
COMEDY & ENTERTAINMENT	NIGAHIGA	20.1	Instagram 2.7	
COMEDY & ENTERTAINMENT	JENNA MARBLES	17.6	Instagram 4.5	
COMEDY & ENTERTAINMENT	KSI	17.3	Instagram 4.7	
GAMING	ELRUBIUSOMG	25.9	Twitch 0.17	
GAMING	FERNANFLOO	24.2	Twitch <0.01	
GAMING	JUEGAGERMAN	21.9	Twitch 6.9	
GAMING	VANOSSGAMING	21.5	Twitch <0.01	
GAMING	VEGETTA777	19.4	Twitch 0.47	

Sources: Activate analysis, Instagram, Socialblade, Twitch

The top U.S. media company creators on YouTube are TV shows, artists and TV networks

YOUTUBE VIEWS FROM MEDIA COMPANIES BY GENRE[1,2], GLOBAL, Q2 2017,% VIEWS

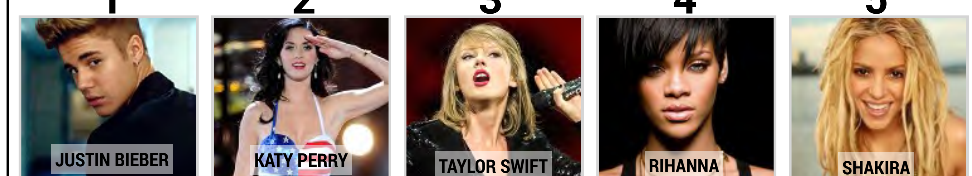


MOST VIEWED MEDIA COMPANIES ON YOUTUBE BY CATEGORY, U.S., AUG 2017, BILLION VIEWS

ENTERTAINMENT

1	2	3	4[3]	5
Total Views: 12.9B	Total Views: 11.1B	Total Views: 9.2B	Total Views: 6.8B	Total Views: 6.4B

MUSIC & DANCE



1	2	3	4	5
Total Views: 16.3B	Total Views: 14.4B	Total Views: 13.1B	Total Views: 12.0B	Total Views: 11.4B

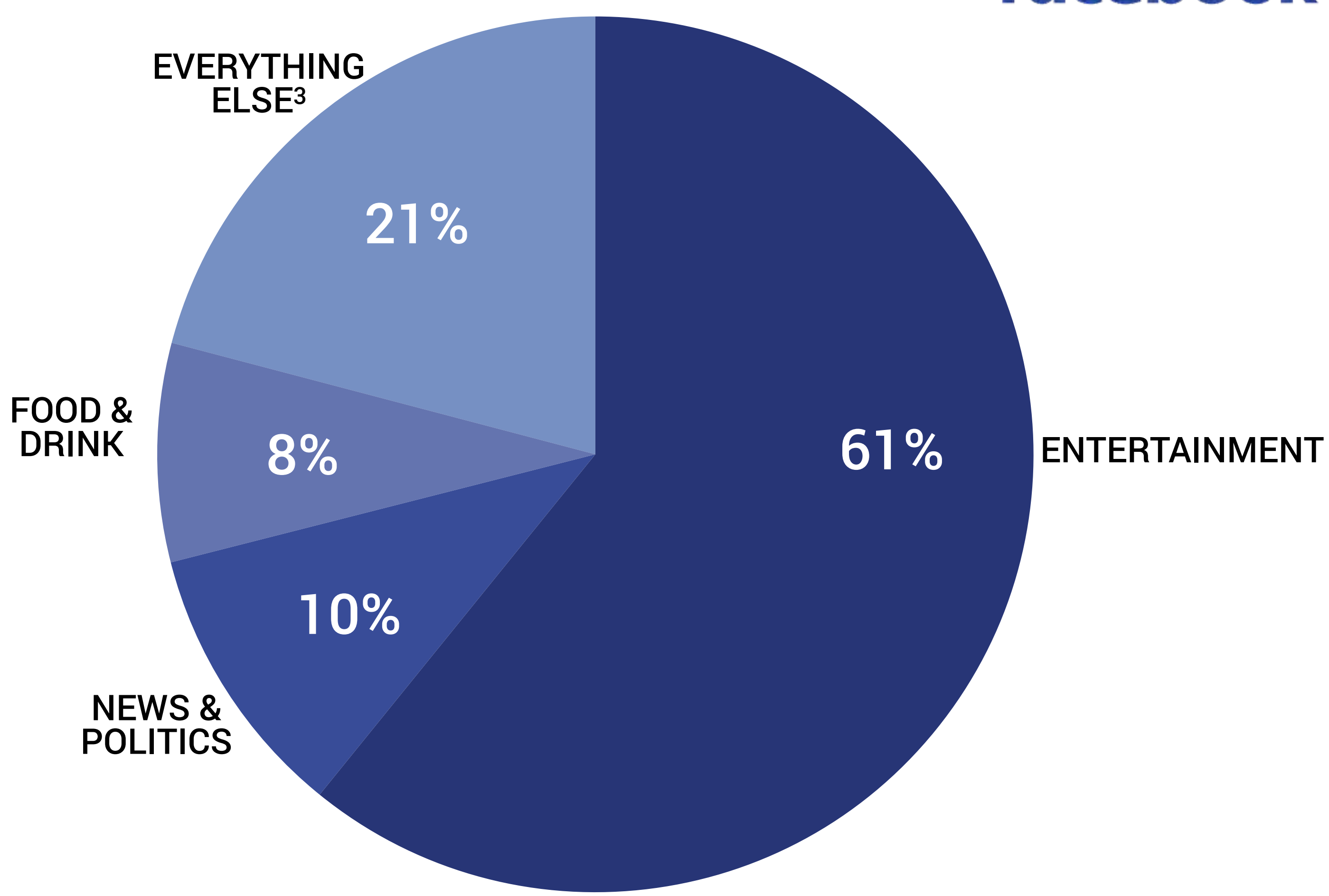
NEWS & POLITICS

1	2	3	4	5
Total Views: 3.9B	Total Views: 3.2B	Total Views: 2.3B	Total Views: 2.2B	Total Views: 2.2B

1. Among media companies with 10M+ views. Media companies defined as organizations whose primary business model is in production and/or distribution of content. Includes some professional influencer entities that have moved upstream. 2. Video category names were self-reported by creators. 3. Smosh used to be recognized as an influencer but has recently worked on films produced by Lionsgate and Columbia Pictures. 4. Other categories include Animals & Pets, Beauty, Cars, Education, Fashion & Style, Film & Movies, Food & Drink, Gaming, General Interest, Health & Fitness, Home & DIY, Kids Entertainment, People & Blogs, Science & Tech, Sports, Travel.
Sources: Activate analysis, Tubular Labs

The top U.S. media company creators on Facebook are online publishers

FACEBOOK VIEWS FROM MEDIA COMPANIES BY GENRE[1,2], GLOBAL, Q2 2017,% VIEWS



MOST VIEWED MEDIA COMPANIES ON FACEBOOK BY CATEGORY, U.S., AUG 2017, BILLION VIEWS

facebook

ENTERTAINMENT

1	2	3	4	5
BRIGHT SIDE	FAIL ARMY	BuzzFeed VIDEO	9GAG	JUKIN VIDEO
Total Views: 15.7B	Total Views: 13.3B	Total Views: 12.0B	Total Views: 10.8B	Total Views: 8.5B

NEWS & POLITICS

1	2	3	4	5
NOW THIS	NTD.TV	AJ+	CNN	FOX NEWS
Total Views: 19.4B	Total Views: 15.9B	Total Views: 12.2B	Total Views: 9.5B	Total Views: 8.5B

1. Among media companies with 10M+ views. Media companies defined as organizations whose primary business model is in production and/or distribution of content. Includes some professional influencer entities that have moved upstream. 2. Video category names were self-reported by creators. 3. Other categories include Animals & Pets, Beauty, Cars, Education, Fashion & Style, Film & Movies, Music & Dance, Gaming, General Interest, Health & Fitness, Home & DIY, Kids Entertainment, People & Blogs, Science & Tech, Sports, Travel.
Sources: Activate analysis, Tubular Labs

Influencers who start on a platform do not typically transfer success to another

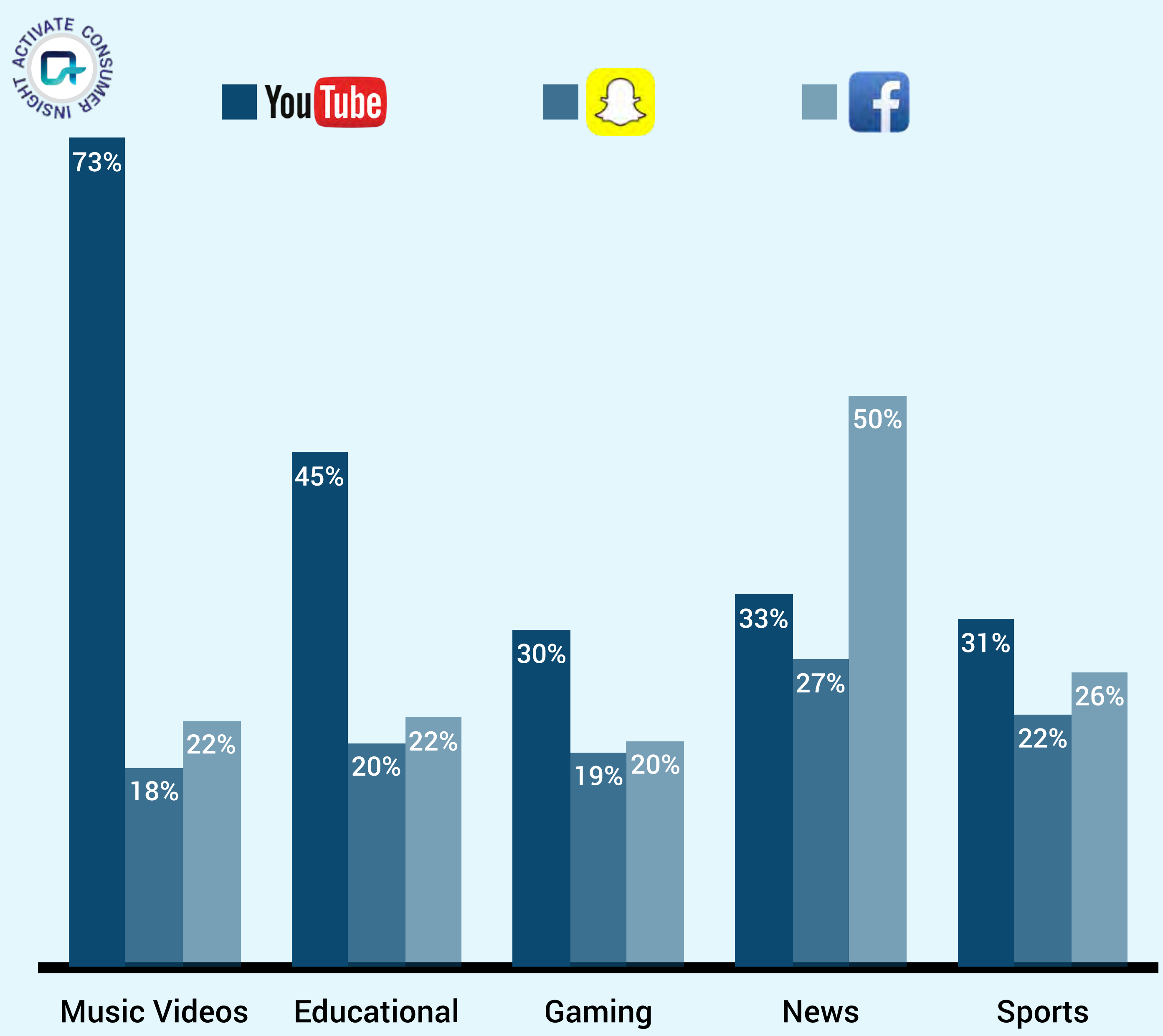
TOP SUBSCRIBED INFLUENCER ACCOUNTS BY NATIVE PLATFORM, GLOBAL, **SEP 2017, MILLION SUBSCRIBERS/FOLLOWERS**

Native platform	Influencer	YouTube	facebook	twitch
YOUTUBE NATIVE	PewdiePie	56	7.4	0.9
	HolaSoyGerman	32	16.2	NA
	El Rubius	25	<0.01	0.2
	Smosh	23	6.9	<0.01
	Fernanfloo	23	5.3	NA
FACEBOOK NATIVE	Logan Paul	12.1	12.8	NA
	Eh Bee	4.1	10.3	NA
	Lance Stewart	3.6	8.8	NA
	King Bach	1.6	8.3	NA
	Curtis Lepore	0.8	8.0	NA
TWITCH NATIVE	Syndicate	10	1.5	2.5
	Nightblue3	2.1	0.3	1.7
	Summit1g	0.4	0.04	1.6
	LIRIK	0.2	NA	1.5
	PhantomL0rd	0.5	0.4	1.5

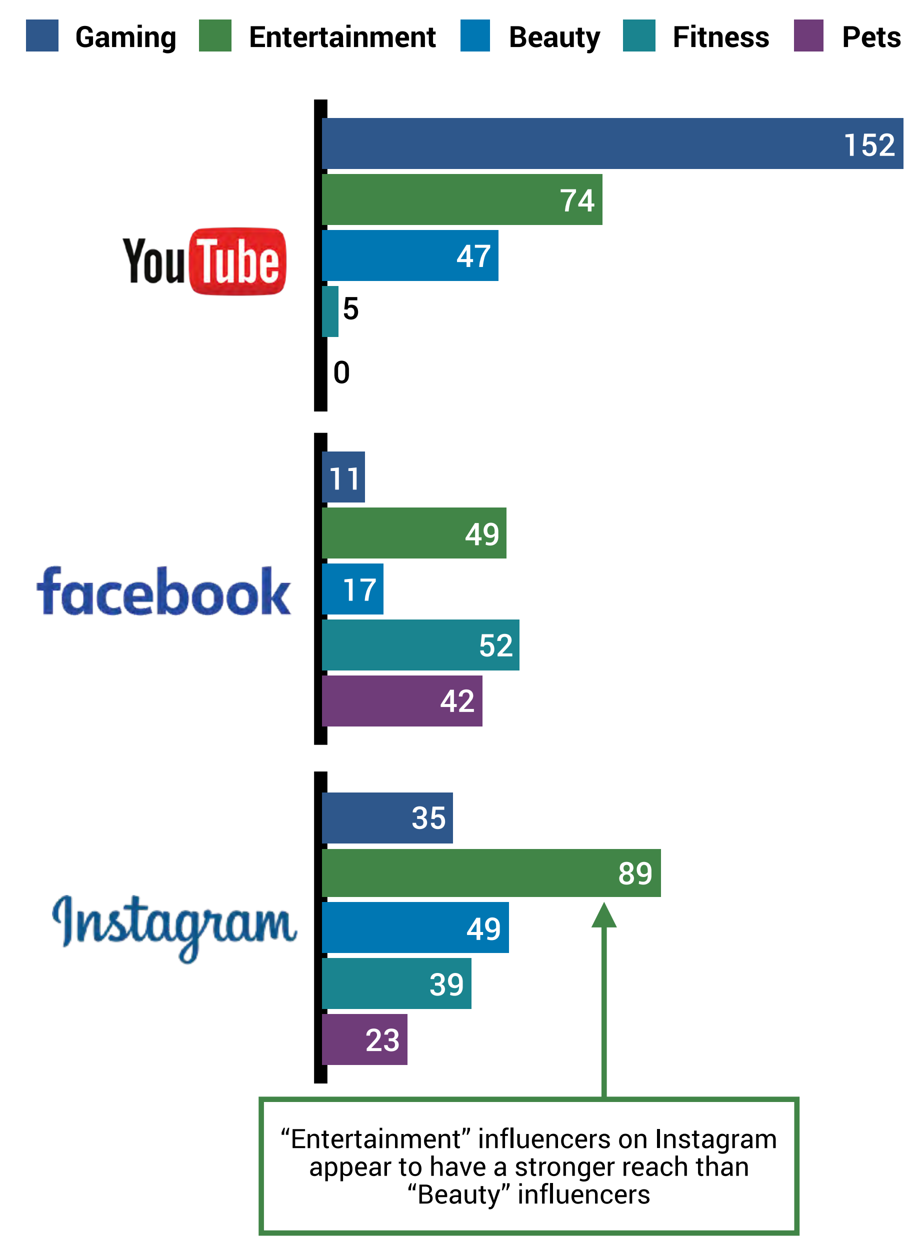
Sources: Activate analysis, Business Insider, Facebook, MediaKix, Socialblade, Twitch

Web video platforms satisfy different content preferences — media companies will need to play to each platform's strengths

VIEWERS BY TOPIC AND PLATFORM, U.S., **SEP 2017, % POPULATION**



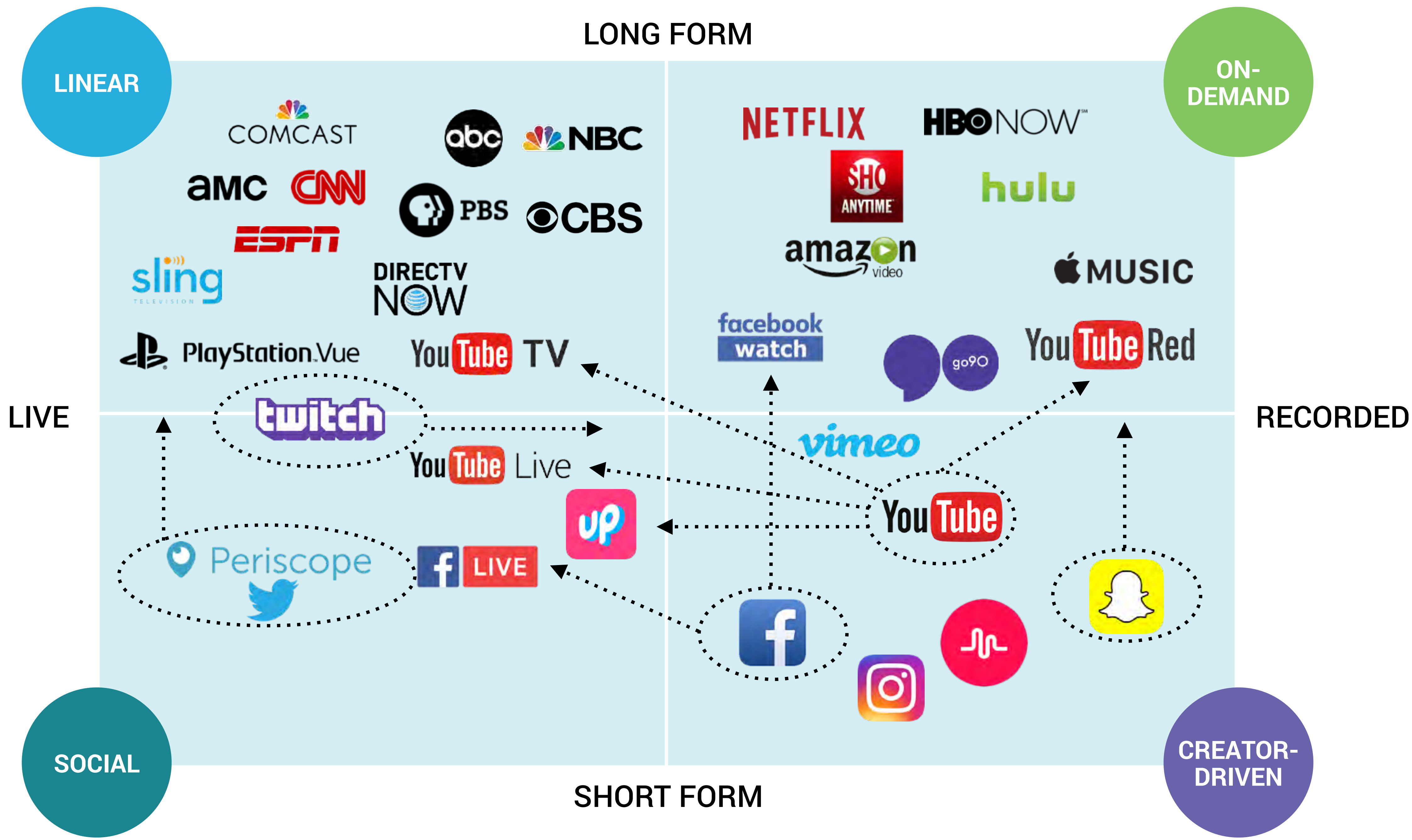
COMBINED REACH OF TOP INFLUENCERS[1] BY PLATFORM AND CATEGORY, GLOBAL, SEP 2017, MILLION SUBSCRIBERS/FOLLOWERS



1. Top influencers is defined as Forbes Top 10 Influencers list. The list was generated along with Traackr and Captiv8 to measure reach, virality, engagement, earnings per post, outside endorsements, and reputation.
Sources: Activate analysis, Activate 2017 Consumer Tech & Media Research Study (Facebook: n=2,641, Snapchat: n=969, YouTube: n=2,940), Forbes

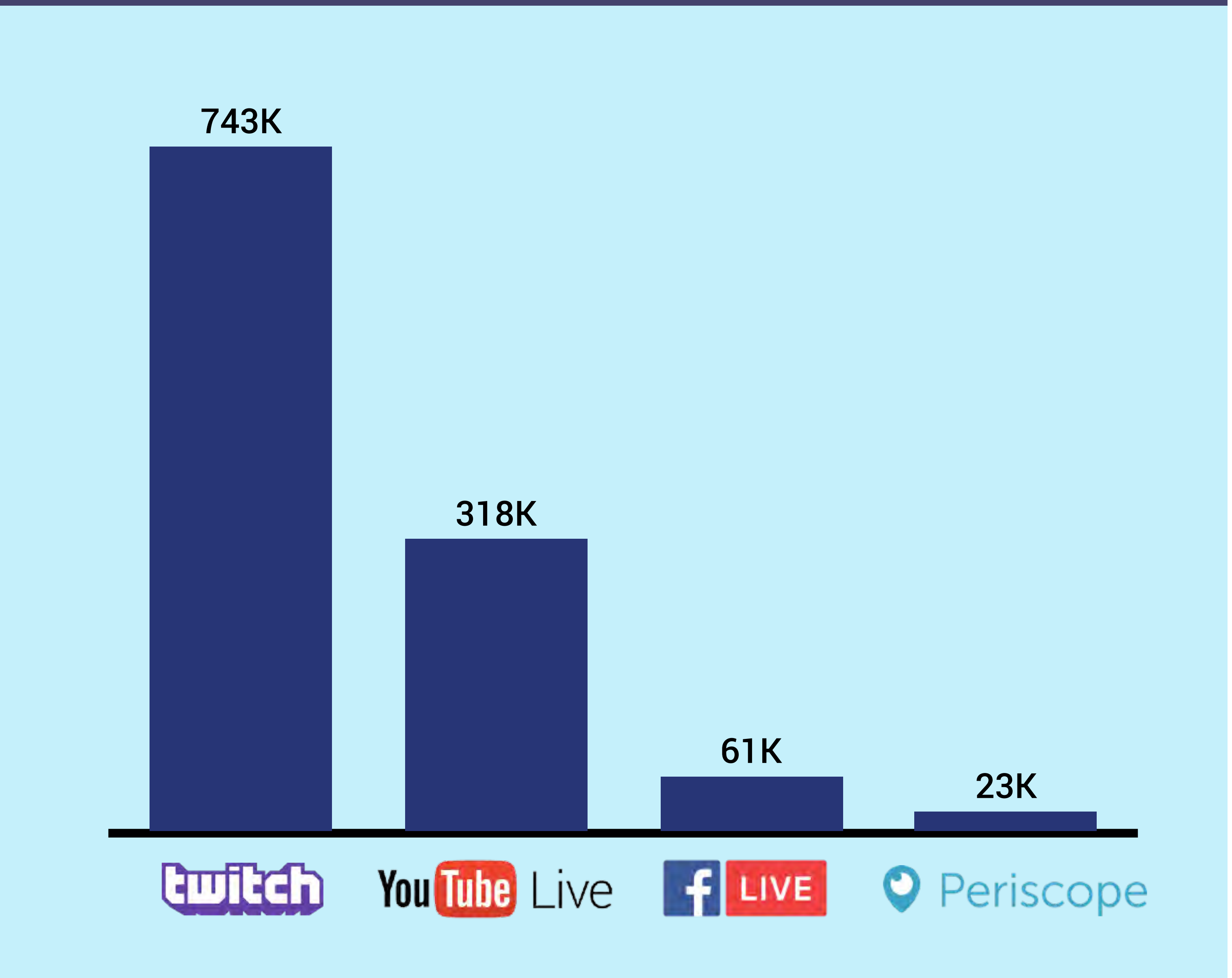
To attract these creators and capture user attention, web video platforms are attempting to move into each others' turfs

VIDEO SEGMENTATION MATRIX

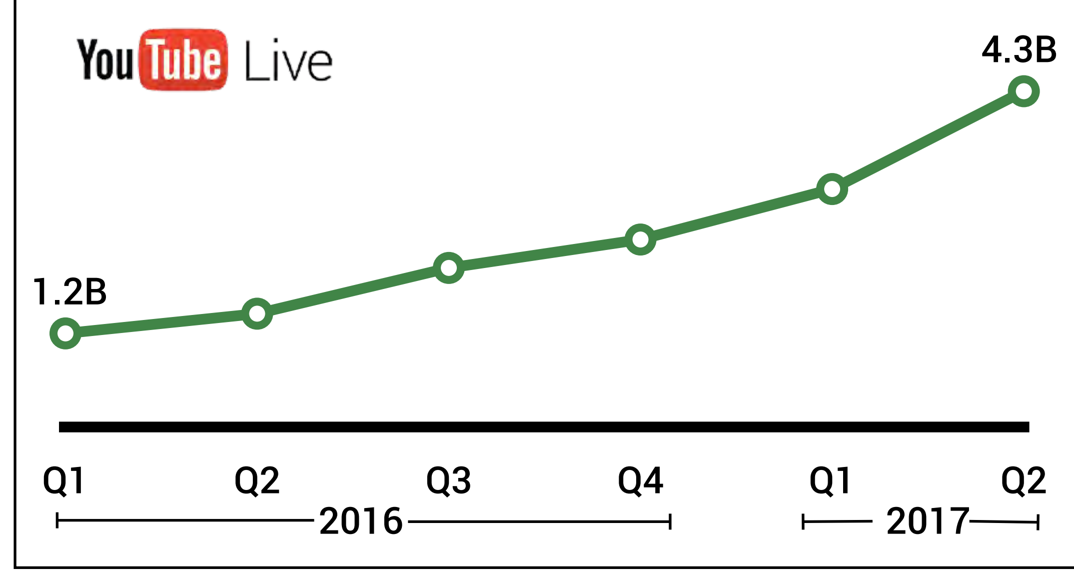


The platforms are also shifting into live streaming – this medium has exhibited rapid growth in views and time spent

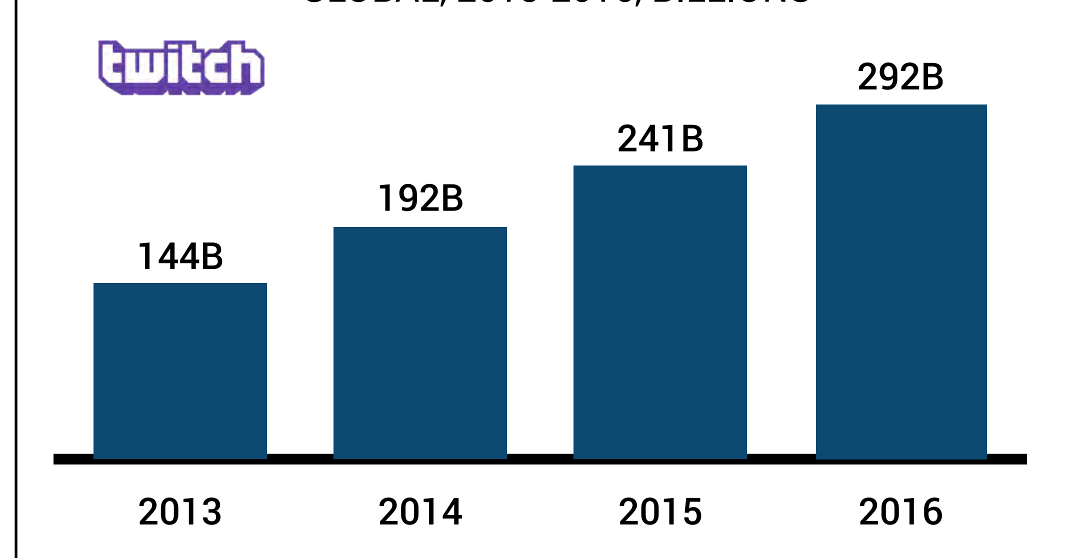
AVERAGE LIVE STREAMING VIEWERS BY PLATFORM,
GLOBAL, **Q2 2017, THOUSAND VIEWERS**



YOUTUBE LIVE GAMING VIEWS,
GLOBAL, 2016-2017, BILLIONS



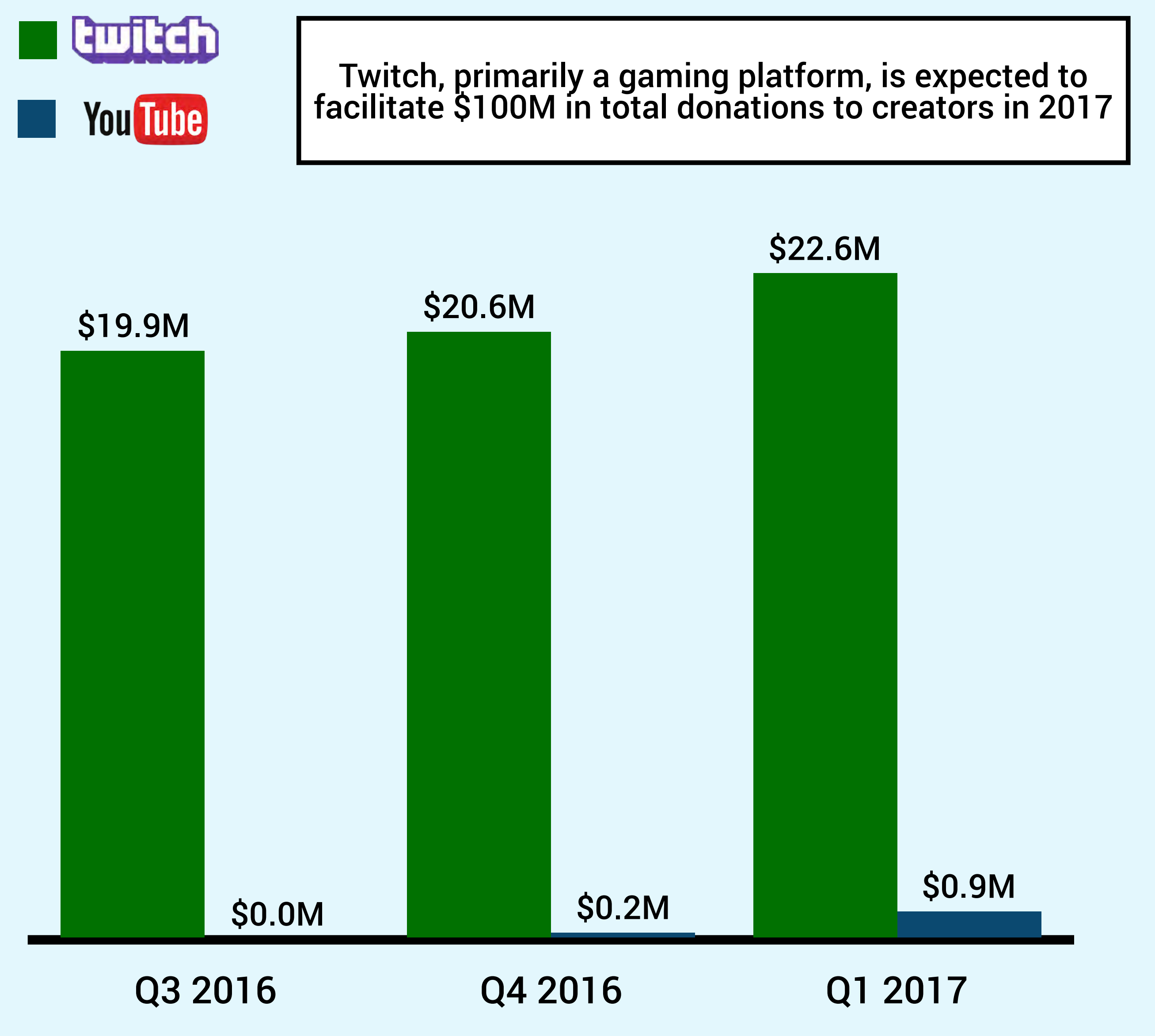
MINUTES WATCHED ON TWITCH,
GLOBAL, 2013-2016, BILLIONS



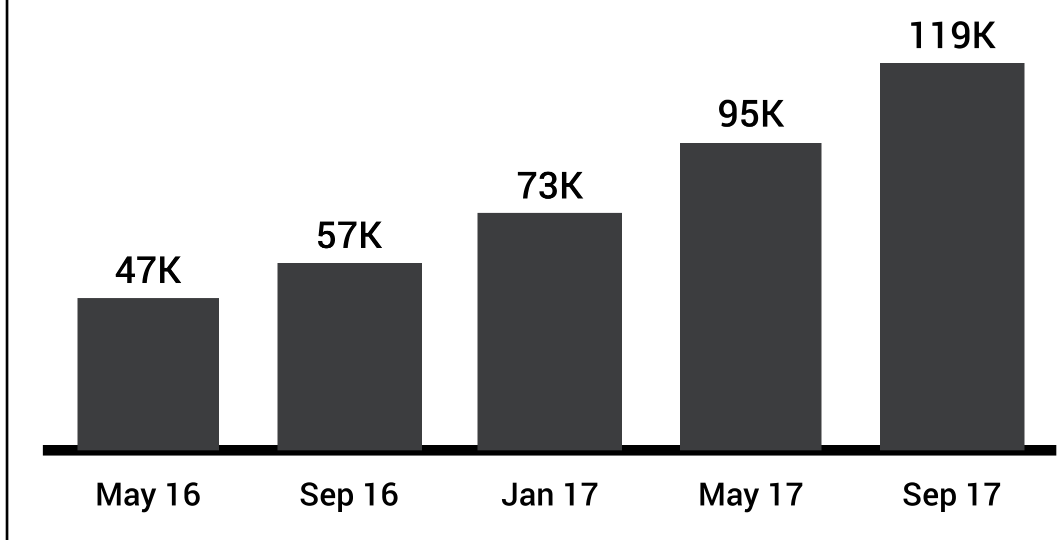
Sources: Activate analysis, Streamlabs, Tubular Labs, Twitch

Live-streaming creators will use crowdfunding platforms, such as Patreon, to monetize directly through fans

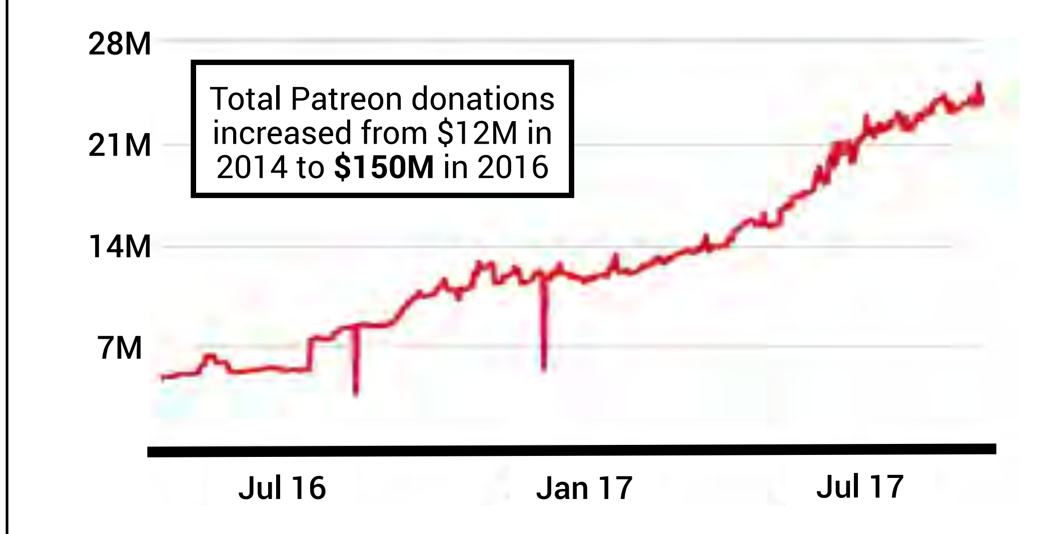
DONATION VOLUME BY LIVE-STREAMING PLATFORM,
GLOBAL**, Q3 2016-Q1 2017, MILLIONS USD**



TOTAL PATRONS OF ALL VIDEO PATREON CAMPAIGNS,
GLOBAL, MAY 2016-SEP 2017, THOUSANDS



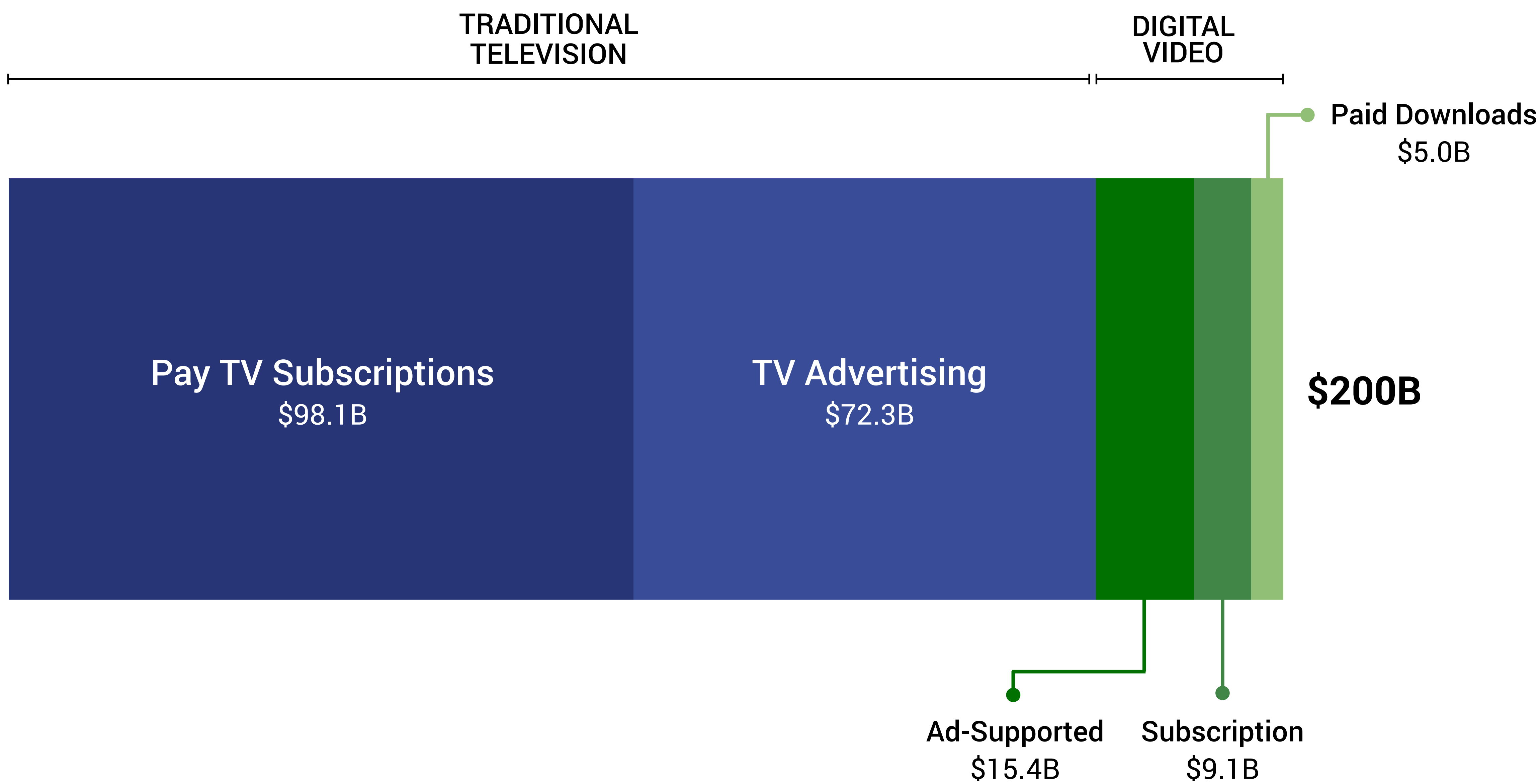
TOTAL YOUTUBE SUBSCRIBERS OF ALL VIDEO PATREON CAMPAIGNS, GLOBAL, 2016-2017, MILLIONS



The Most Important Insights for Tech and Media in 2018

U.S. video revenues will continue to expand, with Pay TV still the dominant segment, but digital surging in growth

VIDEO REVENUES, U.S., 2018E, BILLIONS USD



Note: Paid downloads estimate updated to include rentals, leading to substantial increase over 2016 Activate Tech and Media Outlook estimates. Ad-supported video includes digital TV Everywhere viewing. Figures do not add to $200B due to rounding.
Sources: Activate analysis, Digital TV Research, eMarketer, PricewaterhouseCoopers, SNL Kagan, Strategy Analytics

The future winners in television and video streaming will look quite familiar to consumers

PLAYER	RATIONALE
SVOD PLATFORMS	• Dominant SVOD platforms will expand their originals budgets and acquire major franchises in order to retain their existing fanbases and attract cord-cutters • Niche SVOD services will face significant consumer acquisition obstacles, and will likely require distribution by the major players in order to find audiences
MAJOR MVPDS	• Virtual Pay TV will face a number of challenges, including low profitability, high churn, and misalignment with consumer behaviors • The option value of the traditional cable bundle, as well as the cost-effectiveness of bundling, will limit cord-cutting in the near- and mid-term
LEADING BROADCASTERS	• The growth of ATSC 3.0 will provide broadcasters with a compelling offering for non-Pay TV viewers, combining streaming services and high-demand broadcast channels into a low-cost package
MOBILE CARRIERS	• Television delivery will be a key use case for 5G, particularly fixed wireless-to-the-home • Carriers will be able to zero-rate high-value content over increasingly fast mobile connections
STUDIOS WITH DISTINCTIVE CONTENT	• As digital platforms look to retain customers through valuable franchise purchases, studios will find themselves in a seller's market

Source: Activate analysis

The digital premium video market is becoming more fragmented by the day — every player wants to be in everything

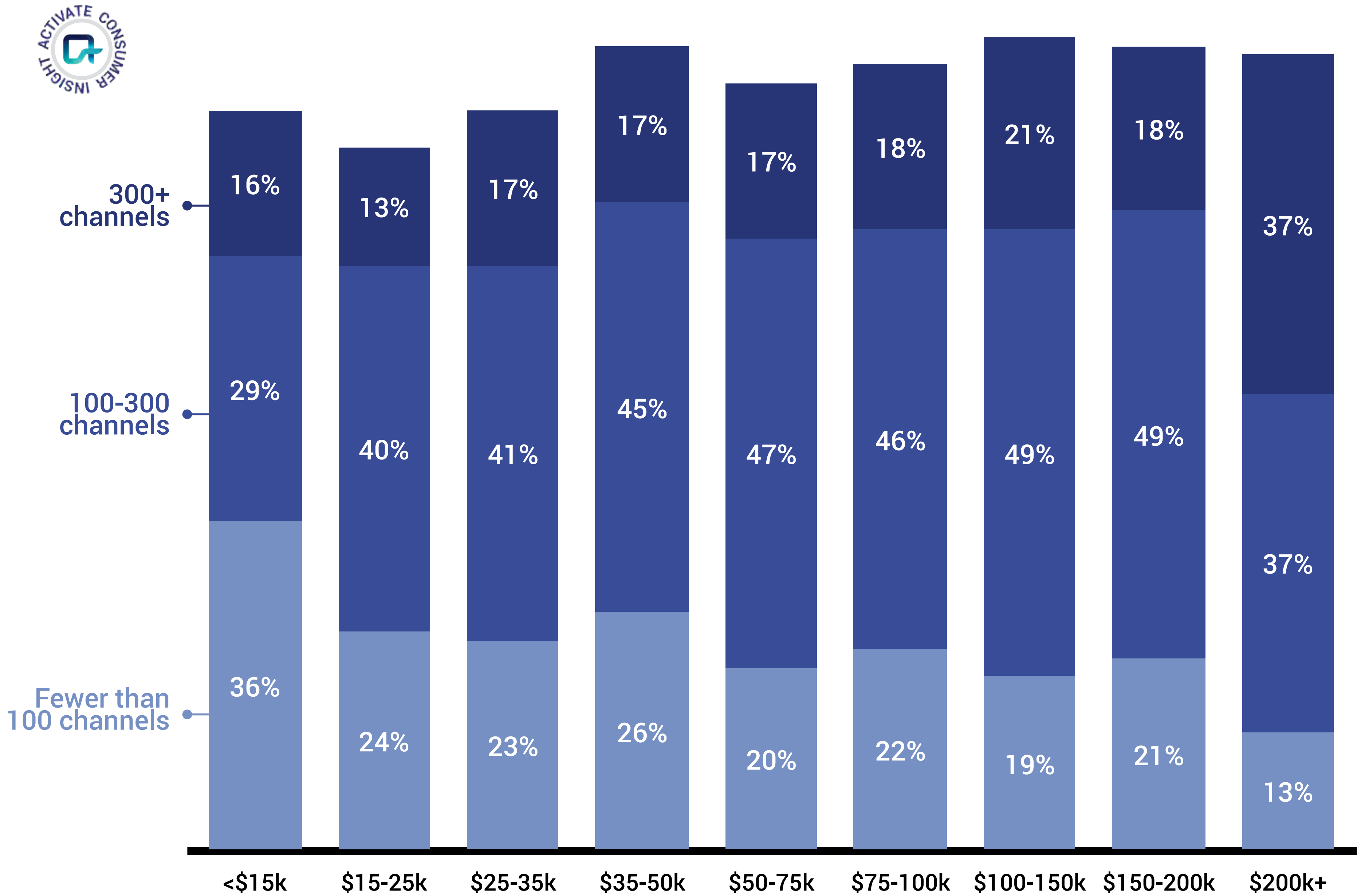
		SELECTED PLAYERS	LIVE/LINEAR VIDEO PROGRAMMING					NON-LINEAR VIDEO PROGRAMMING		
			Broadcast Networks	Cable Networks	Niche Networks	Live Sports	Live Events	DTC/Original Series	Aggregation	Sport Replays
VIRTUAL PAY TV	MVPD-Operated	sling television, DIRECTV NOW	●	●	●	●	●			
VIRTUAL PAY TV	Major Standalone	YouTube TV, hulu, PlayStation	●	●	●	●	●			
VIRTUAL PAY TV	Niche Standalone	fubo TV NETWORK, PLUTO, YiP			●	●				
SUBSCRIPTION VOD	"Big 3"	hulu, amazon video, NETFLIX	●	●		●		●	●	
SUBSCRIPTION VOD	Network Offerings	HBO NOW, CBS ALL ACCESS	●	●		●		●		●
SUBSCRIPTION VOD	Niche Vertical Offerings	SHUDDER, spuul, CuriosityStream, gaia							●	
SOCIAL PLATFORMS	Facebook	facebook				●	●	●		
SOCIAL PLATFORMS	Twitter	twitter		●		●				
TECHNOLOGY PROVIDERS	Apple	Apple				●	●	●	●	

activate

Sources: Activate analysis, Service websites

Larger traditional Pay TV bundles are highly penetrated across all income levels, raising the bar for Virtual Pay TV offerings in terms of channel selection

PAY TV BUNDLE PENETRATION BY INCOME LEVEL, U.S., 2016, SIZE OF BUNDLE, % USERS



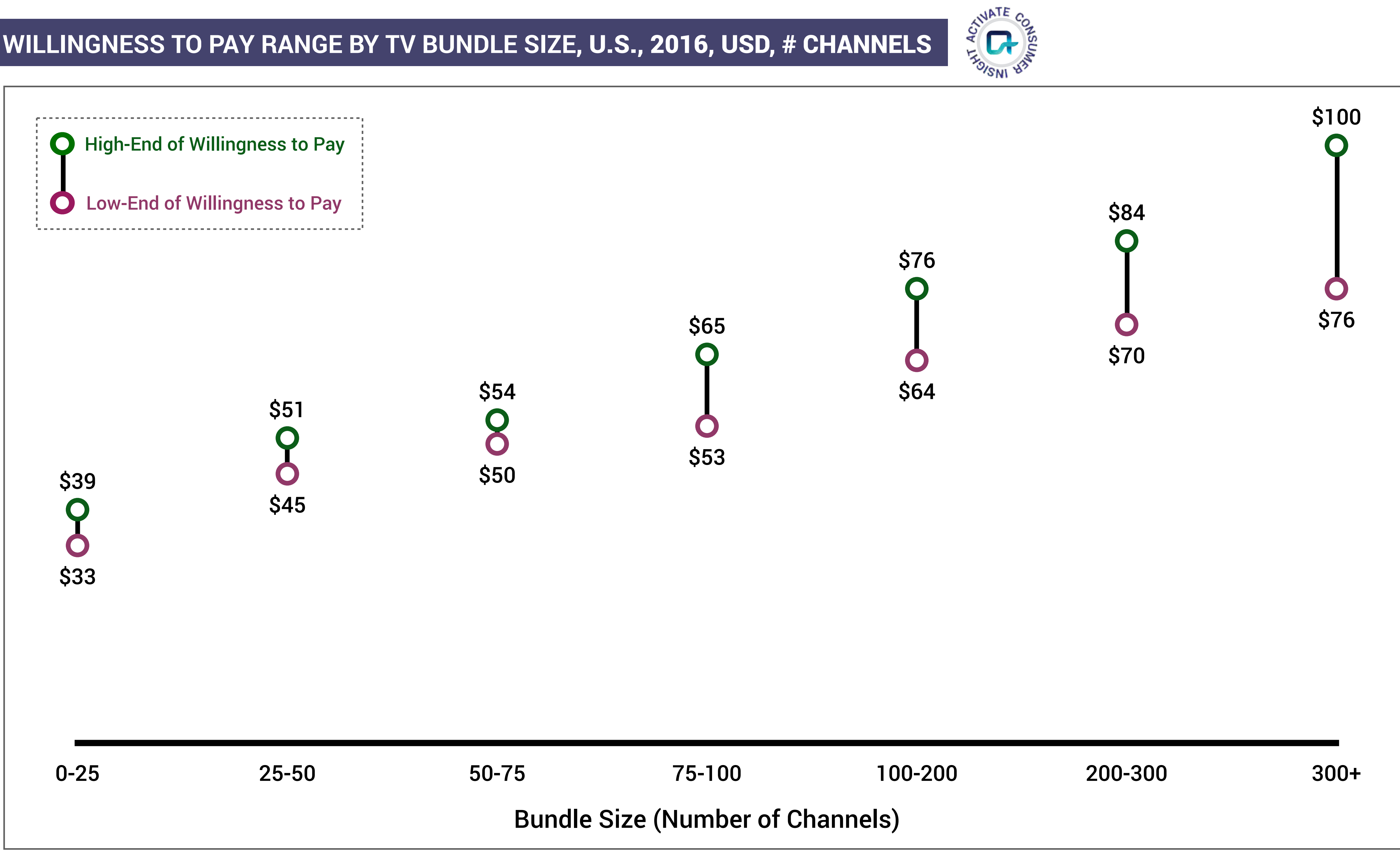
TAKEAWAYS

- Consumers value the content buffet, leading Virtual Pay TV providers to launch "fatter" versions of their initial bundles
- PS Vue and DirecTV Now are offering bundles with roughly 100 channels for $70+/month
- Services are likely more expensive after the inclusion of unbundled broadband

Sources: Activate analysis, Activate 2016 Consumer Tech & Media Research Study (n=2,769)

Our research shows that consumers still value the content buffet, and are willing to pay more for a large selection of channels

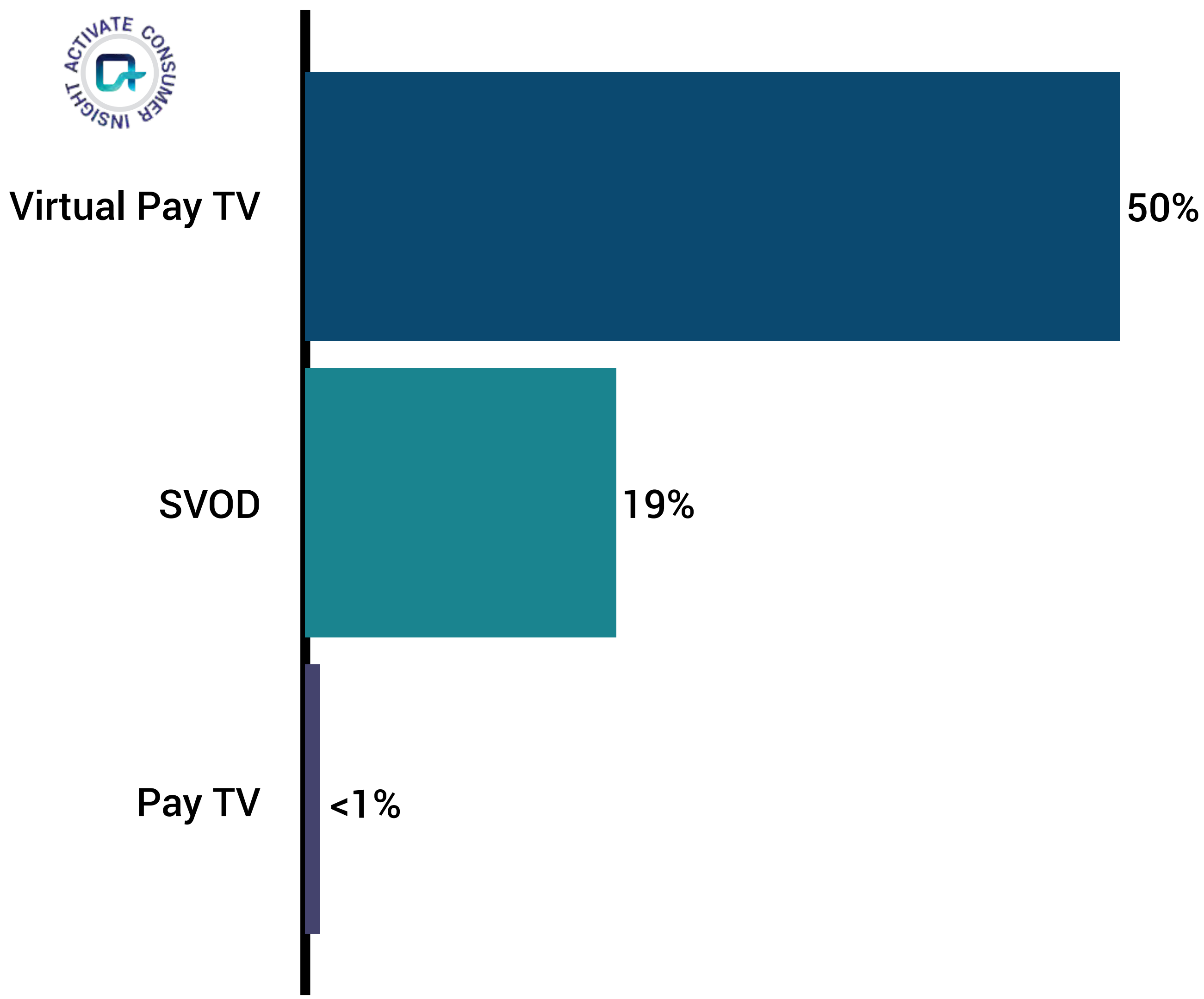
WILLINGNESS TO PAY RANGE BY TV BUNDLE SIZE, U.S., 2016, USD, # CHANNELS



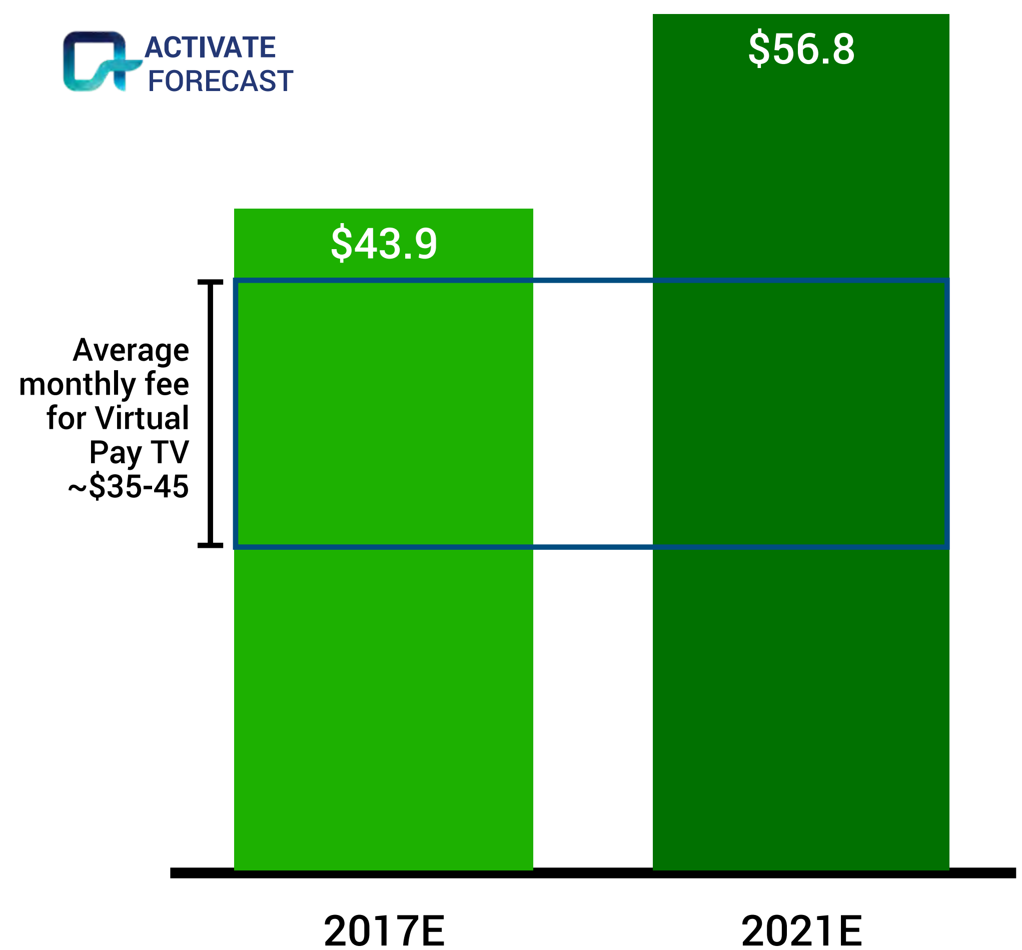
Sources: Activate analysis, Activate 2016 Consumer Tech & Media Research Study (n=2,769)

Customer acquisition and content costs are a formidable challenge for Virtual Pay TV providers

AVERAGE ANNUAL CHURN RATES BY SERVICE[1], U.S., 2017, %



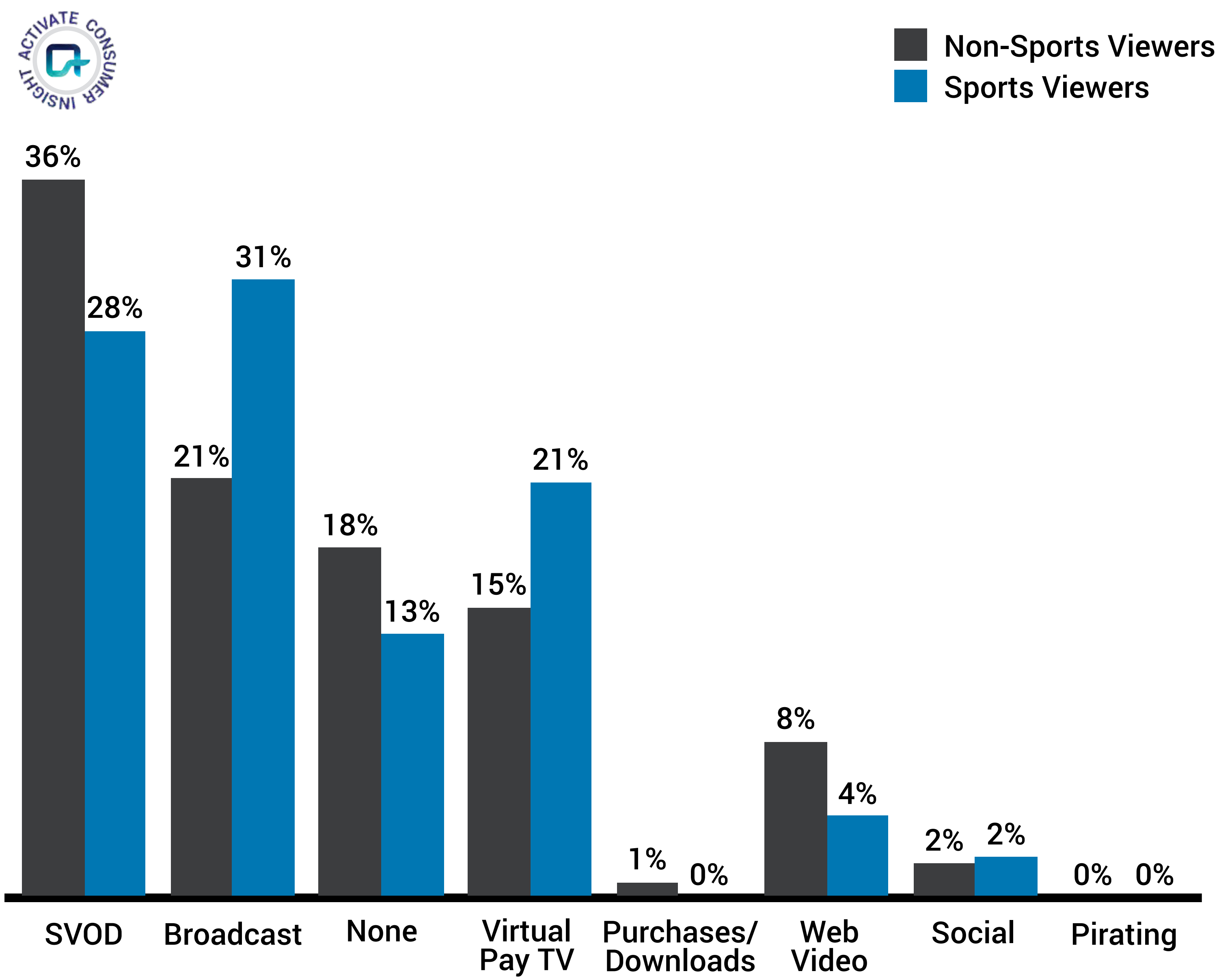
MONTHLY PROGRAMMING COSTS PER SUBSCRIBER FOR STANDARD BUNDLE[2], U.S., 2017E-2021E, USD



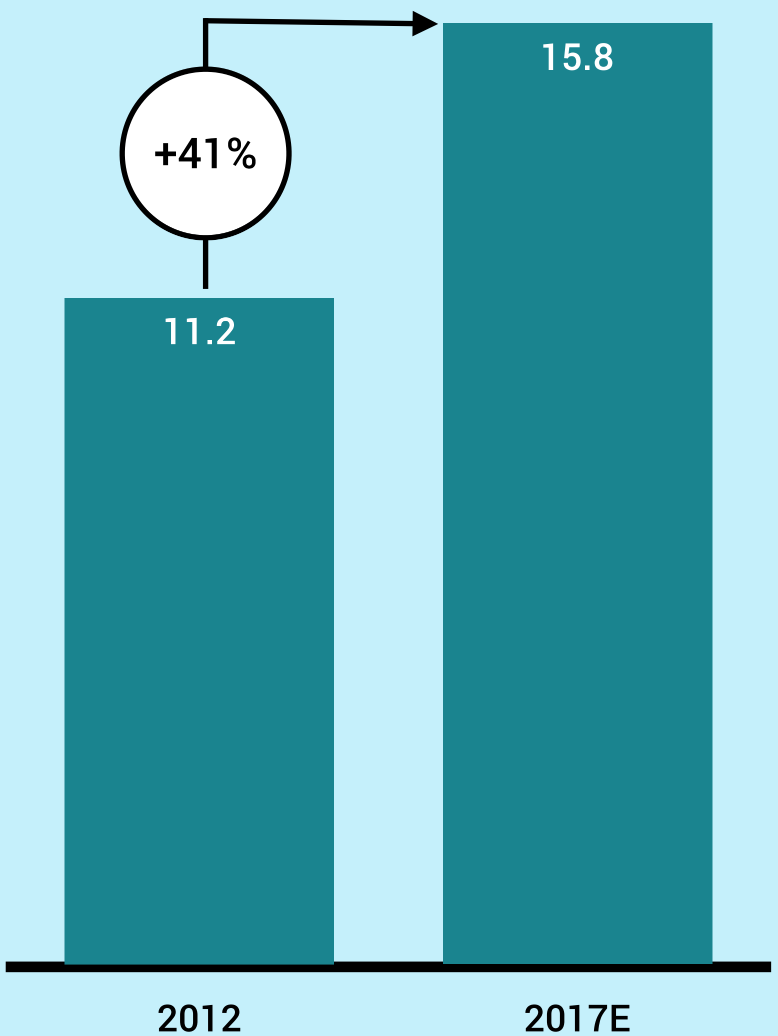
1. Virtual Pay TV churn rate for TTM beginning September 2017, while SVOD churn rate covers CY 2016.
2. Programming costs analysis based on average of base Virtual Pay TV offerings across the major services, and includes only those that offer broadcast networks and/or sports programming. Programming estimates subject to a premium based on reduced scale of Virtual Pay TV offerings, and the resulting impact on per-channel costs.
Sources: Activate analysis, Activate 2017 Consumer Tech & Media Research Study (n=996), CNBC, CNET, Company sites, Leichtman Research Group, Netflix, Parks Associates, Seeking Alpha, SNL Kagan

Broadcast has proven to be more attractive than Virtual Pay TV for cord-cutters that still want traditional live/linear programming – such as sports – at a low cost

CORD-CUTTER SUBSTITUTION BY VIEWER TYPE[1], U.S., 2017, % VIEWERS



OTA BROADCAST-ONLY HOMES, U.S., 2012-2017E, MILLION HOUSEHOLDS



1. Sports viewers defined as those watching more than five hours of sports programming per week. Non-sports viewers as those reporting watching no sports programming on a regular basis.
Sources: Activate analysis, Activate 2017 Consumer Tech & Media Research Study (n=1,172), Ion Media, Nielsen

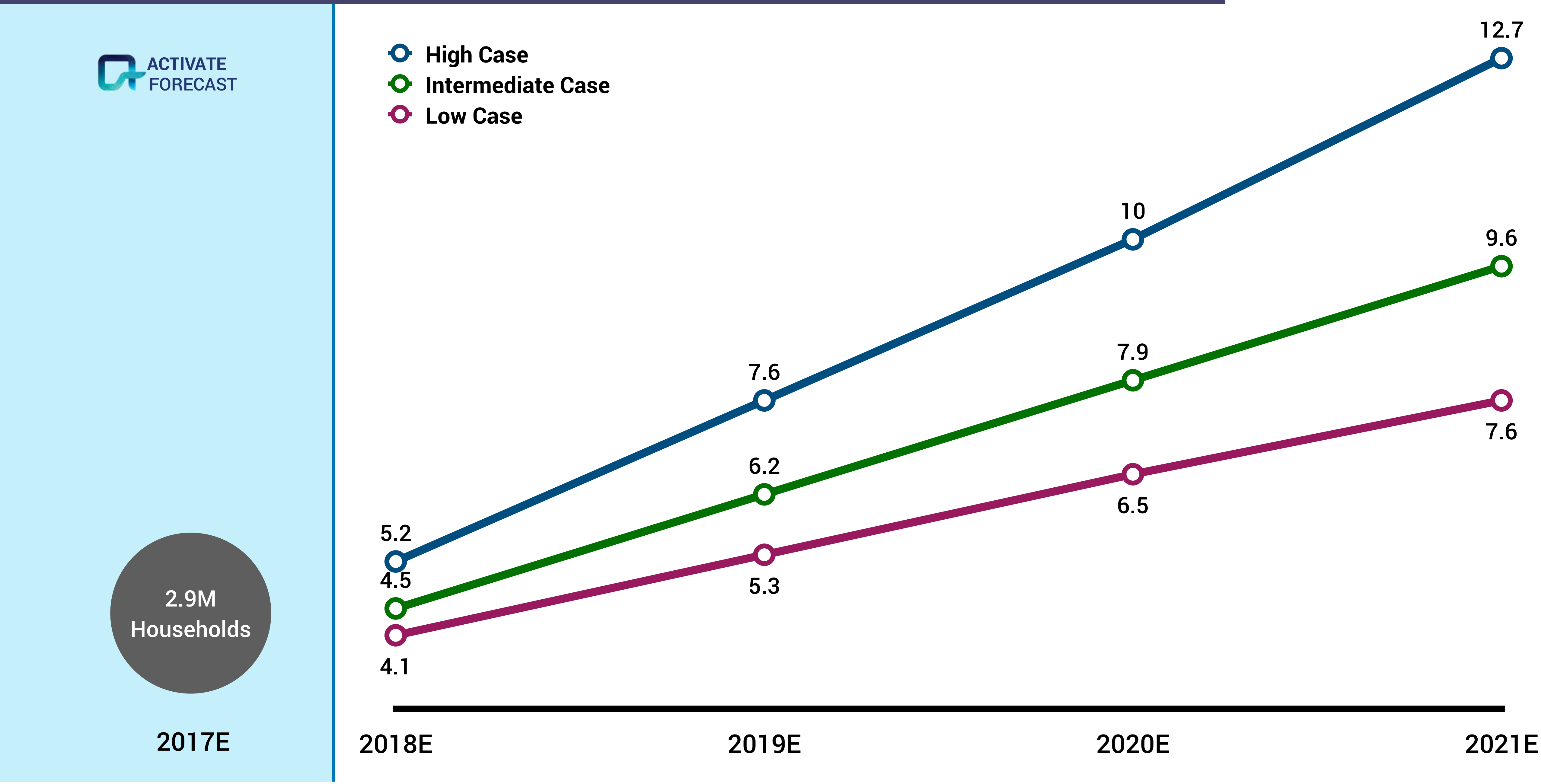
The next generation broadcast standard — ATSC 3.0 — will unify broadcast channels and SVOD services, providing cord-cutters with a way to customize their own "skinny bundles"

BROADCAST STANDARD	DELIVERY	VIDEO QUALITY	CONTENT
ATSC 1.0	**Free** Over-the-Air Broadcast	HD	NBC, CBS, abc, THE CW, FOX, PBS, TELEMUNDO, UNIVISION
ATSC 3.0	**Free** Over-the-Air, **IP-Enabled** Broadcast	4K	NBC, CBS, abc, THE CW, FOX, PBS, TELEMUNDO, UNIVISION POTENTIALLY ALSO NETFLIX, amazon, hulu

- Access to ATSC 3.0 could be as simple as someone plugging a compatible dongle into a television, or connecting an OTT streaming box to also enable SVOD services
- A bundle of free OTA channels — including local affiliates — coupled with access to SVOD services via ATSC 3.0 gives cord cutters an attractive alternative to Virtual Pay TV

We forecast that Virtual Pay TV adoption is likely to remain low in the coming years

PROJECTED VIRTUAL PAY TV HOUSEHOLDS, U.S., JUNE 2017E-2021E, MILLION HOUSEHOLDS



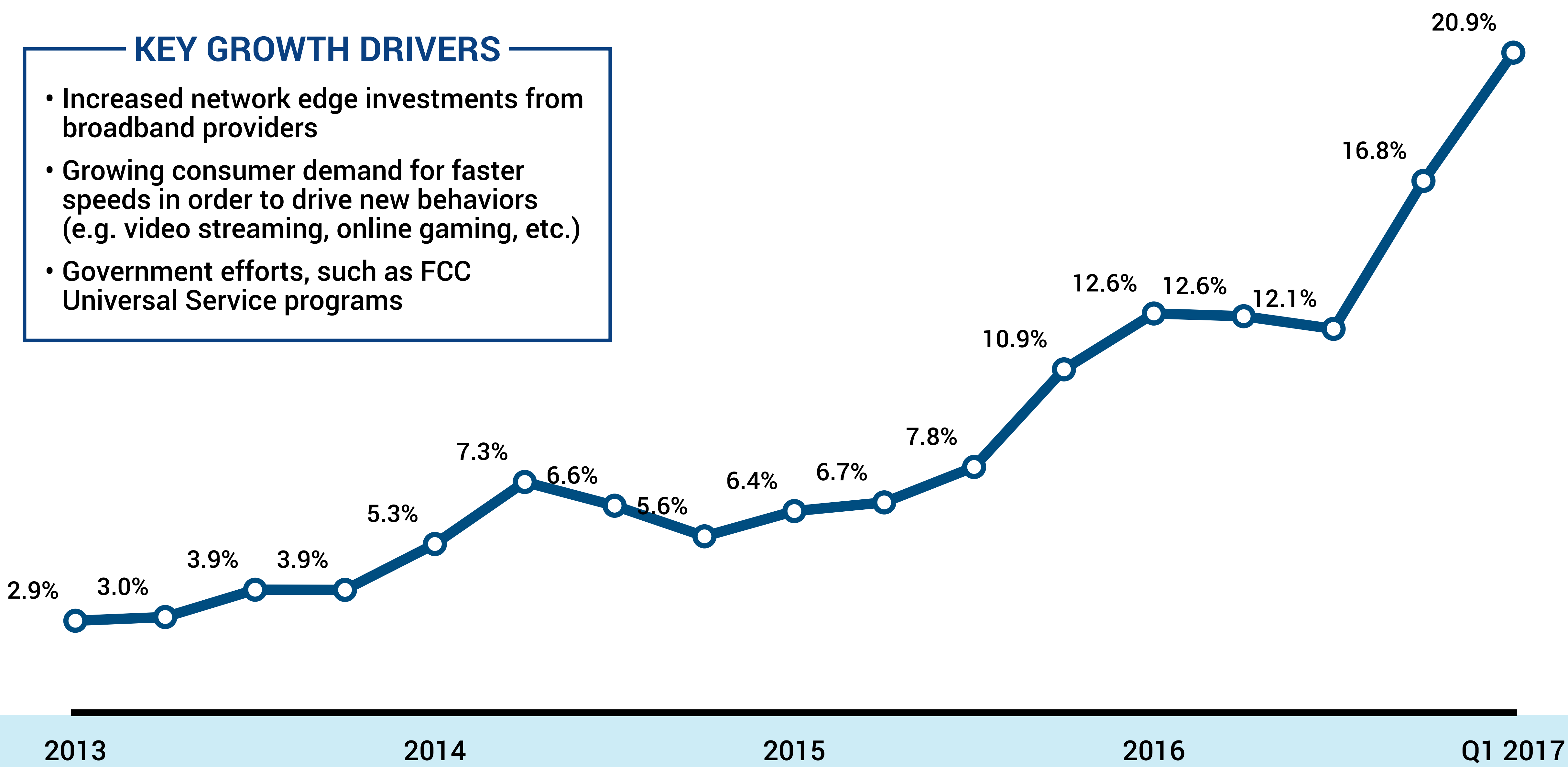
Sources: Activate analysis, Activate 2016 Consumer Tech & Media Research Study (n=4,000), Activate 2017 Consumer Tech & Media Research Study (n=4,047), Akamai, Company reports, SNL Kagan, UBS, U.S. Census Bureau

Only 21% of the country has sufficient bandwidth to receive multiple Virtual Pay TV streams, which will be required for the format to replace traditional television

ADOPTION OF 25+ MBPS BROADBAND, U.S., 2013-Q1 2017, % HOUSEHOLDS

KEY GROWTH DRIVERS

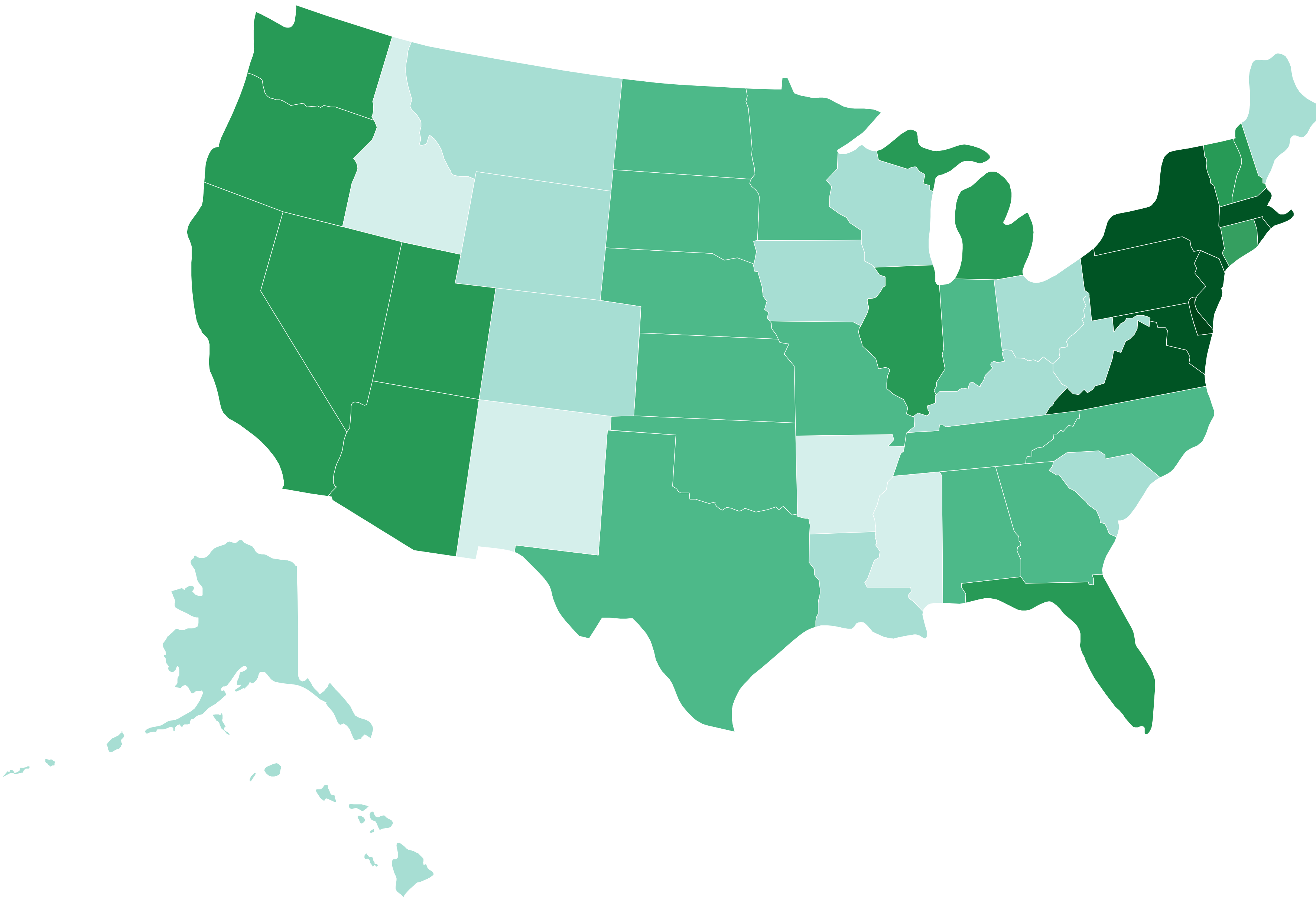
- Increased network edge investments from broadband providers
- Growing consumer demand for faster speeds in order to drive new behaviors (e.g. video streaming, online gaming, etc.)
- Government efforts, such as FCC Universal Service programs



Sources: Activate analysis, Akamai, SNL Kagan, U.S. Census Bureau

Differences in download speeds are not distributed evenly across the country, challenging Virtual Pay TV adoption

ADOPTION OF 25+ MBPS BROADBAND, U.S., Q1 2017, % HOUSEHOLDS



25 Mbps
Sling's recommended speed for households streaming on 2+ devices

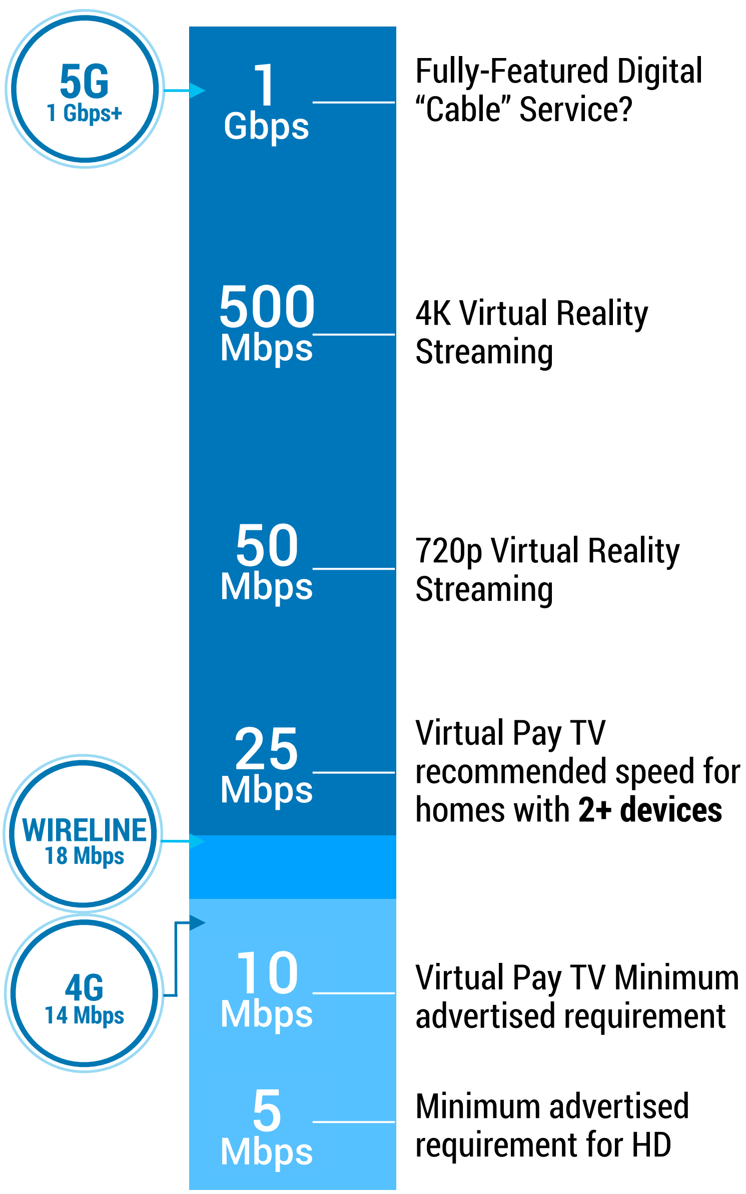
KEY

- <10%
- 21-25%
- 10-15%
- >25%
- 16-20%

Sources: Activate analysis, Akamai, SNL Kagan, U.S. Census Bureau

5G will likely expand Virtual Pay TV delivery, bringing broadened access, lower costs, and expanded channel packages

RANGE OF CONNECTIVITY USE CASES FOR VIDEO STREAMING



AT&T

Began tests in January for 5G Fixed Wireless Access delivery of DirecTV Now in Austin, along with 2 new test beds for 5G technology

verizon

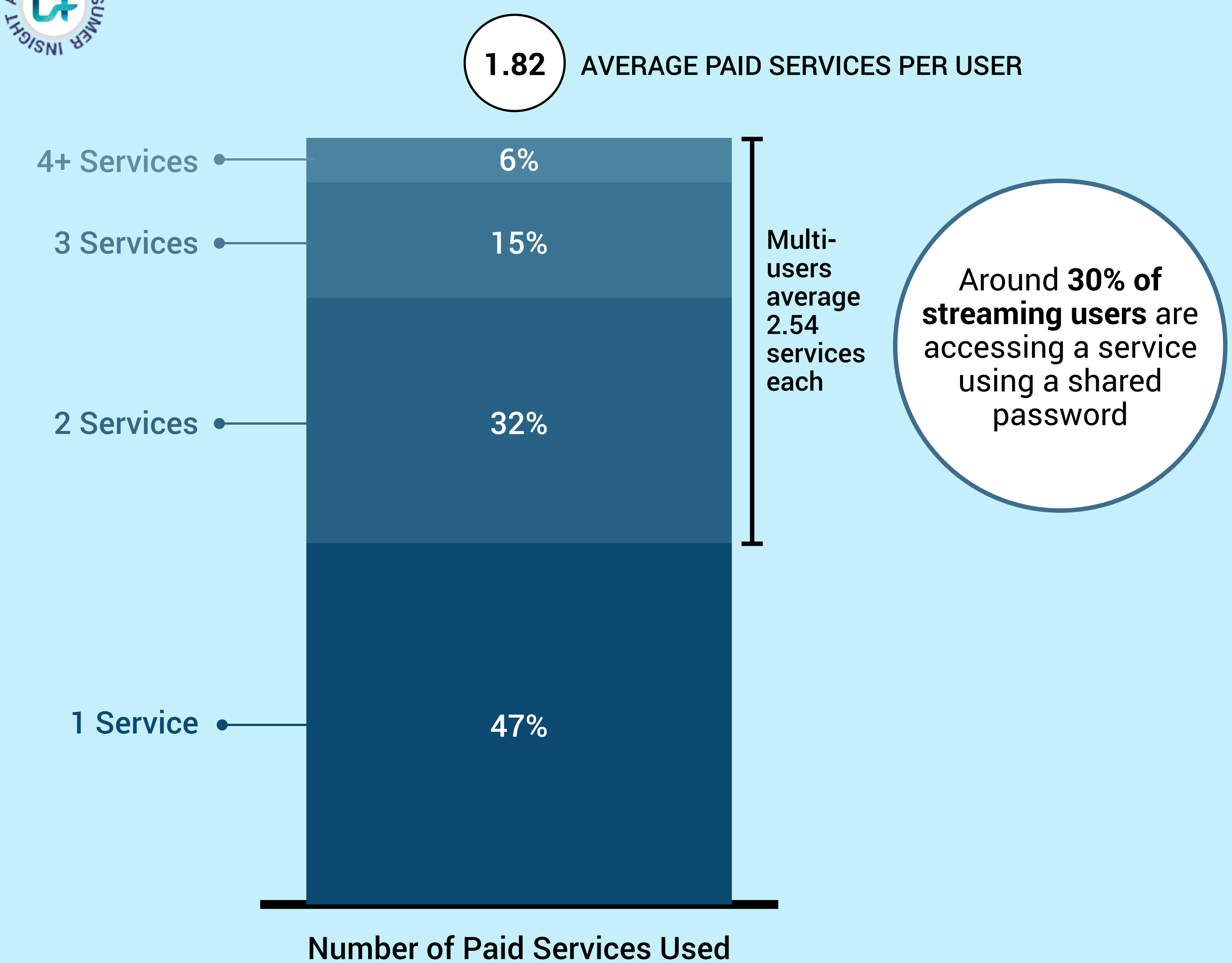
Testing 5G Fixed Wireless Access technology in 11 markets, with indications that they will use 5G to offer services "similar to FiOS"

FACTOR	IMPACT ON VIRTUAL PAY TV
CONNECTIVITY COSTS	• Reduced costs as subscribers migrate to virtual television **bundled with wireless** • **Wireless players increase broadband competition**, driving down overall costs
SUPERIOR RELIABILITY	• **5G offers high-speed, low-latency video at up to 4K resolution**, ameliorating delivery obstacles with current Virtual Pay TV solutions
ZERO-RATING	• Wireless providers **zero-rate proprietary video services (e.g. DirecTV Now)** • Further reduces consumer costs and **encourages cross-platform viewing**
EXPANDED CHANNEL PACKAGES	• Strong connectivity allows Virtual Pay TV packages to expand in size, **providing equal option value to terrestrial television**

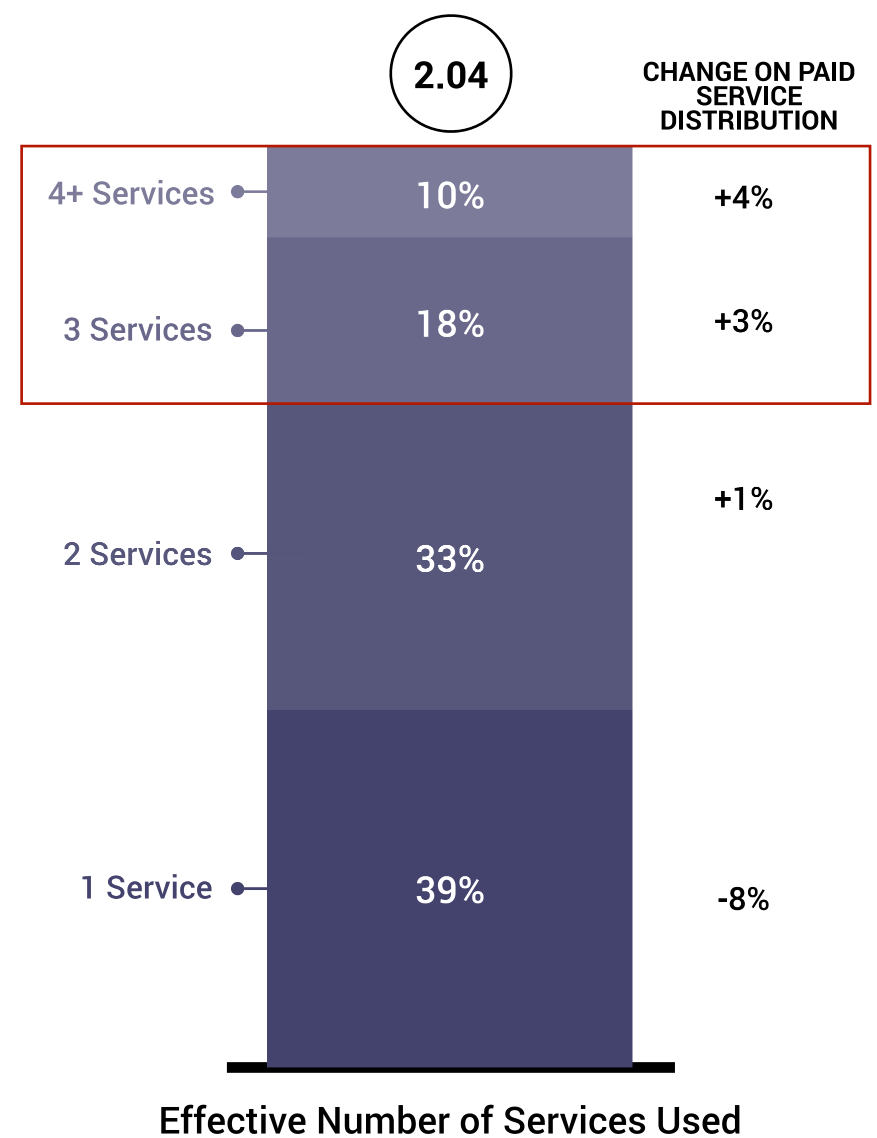
Sources: Activate analysis, ABI, AT&T, Bloomberg, Ericsson, GSMA, Verizon

People are actually watching more streaming video than they are paying for as a result of password sharing

NUMBER OF SVOD SUBSCRIPTIONS PER USER, U.S., 2017, % USERS



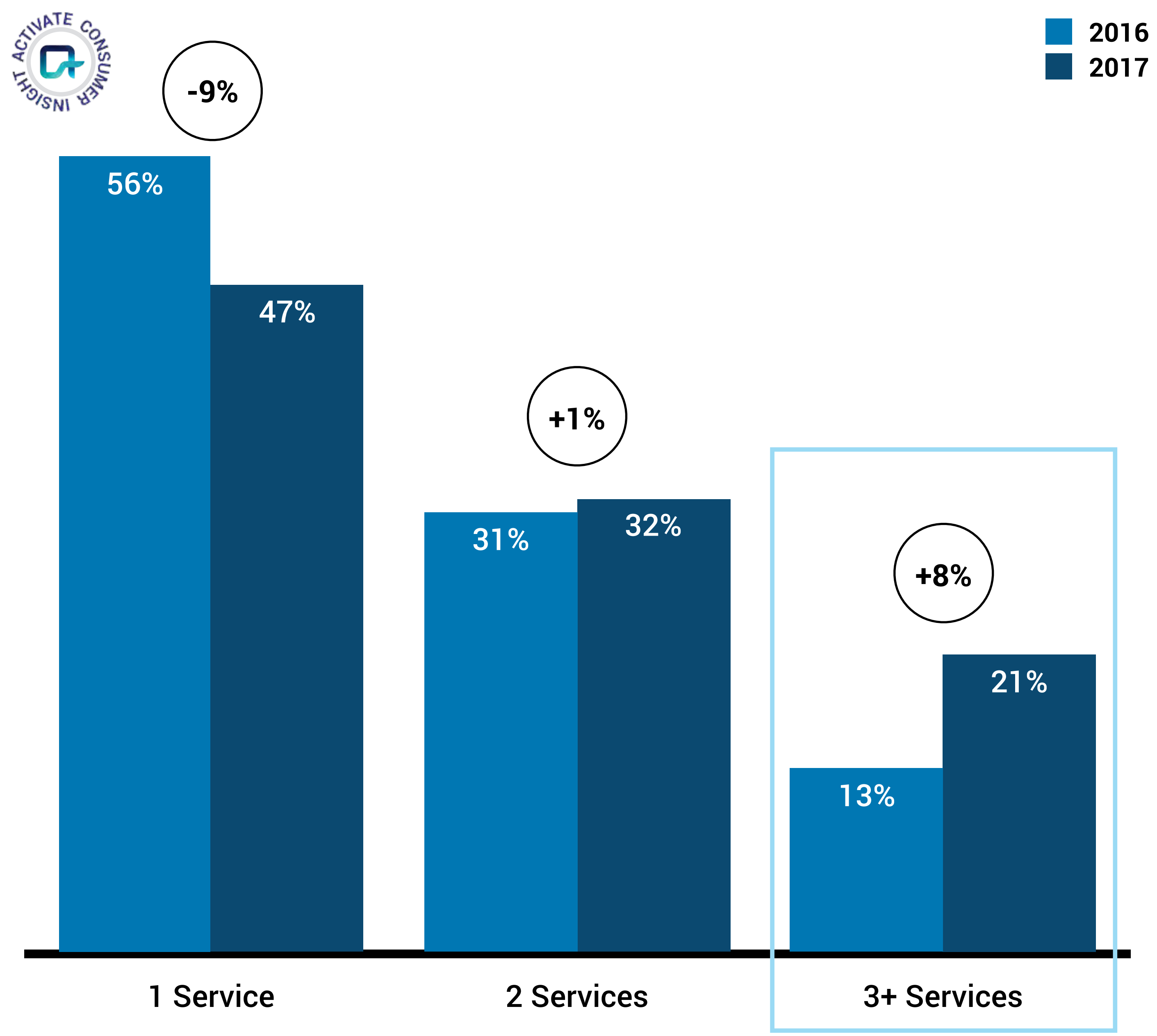
EFFECTIVE NUMBER OF SVOD SERVICES PER USER[1], U.S., 2017, % USERS



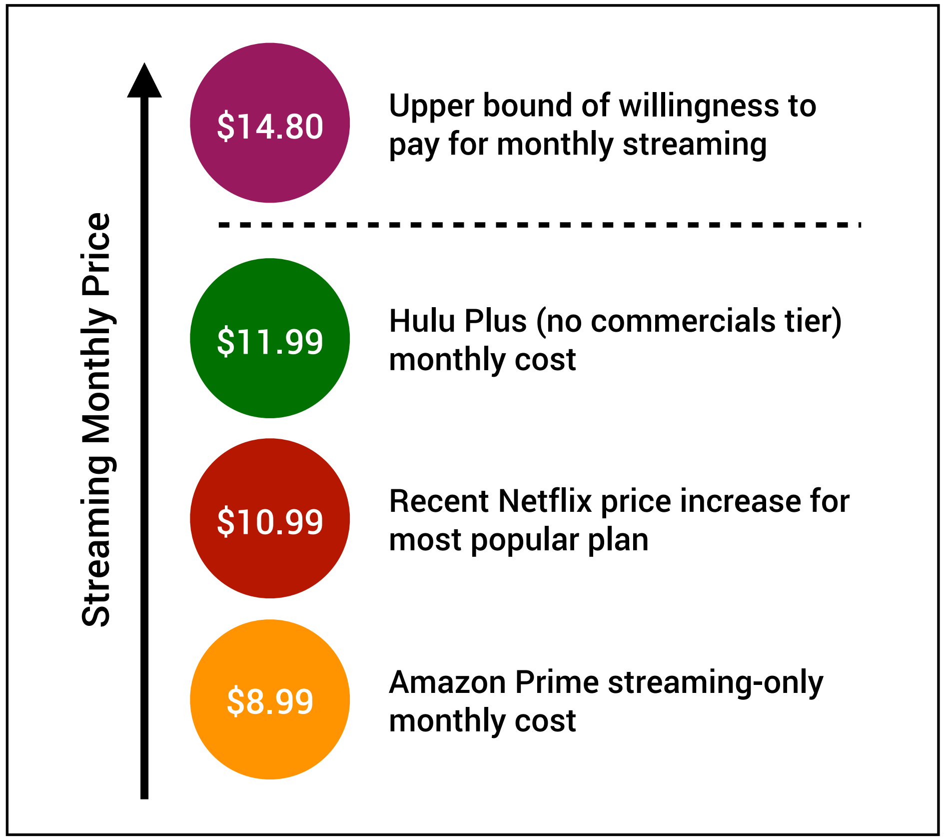
1. Effective bundle defined as total services used after factoring in paid subscriptions and password-sharing.
Sources: Activate analysis, Activate 2017 Consumer Tech & Media Research Study (n=3,023), GfK, Leichtman Research Group, Parks Associates

With the domestic market saturating and consumer willingness to pay flat, the growth in SVOD will come from the most active users increasing their spend

NUMBER OF STREAMING SERVICES USED, U.S., 2016-2017, % USERS



WILLINGNESS TO PAY RANGE FOR SVOD SUBSCRIBERS[1], U.S., 2016

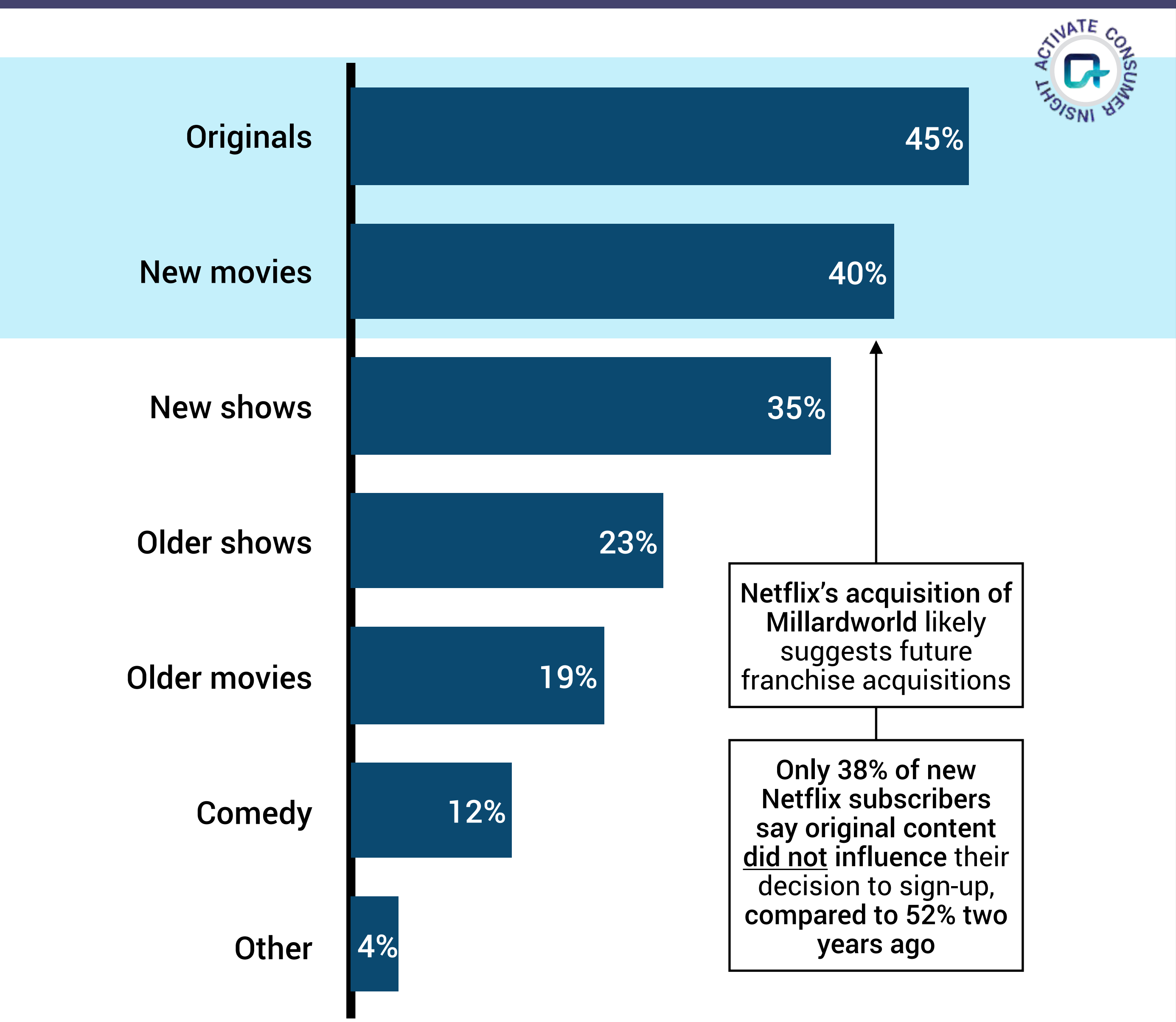


- **Two-thirds of U.S. households now have an SVOD service**, with younger and wealthier demographics heavily over-indexing on format
- **Flattening domestic subscriber growth for Netflix** — the leading service and foundation of roughly 70% of SVOD packages — suggests that **future U.S. growth will need to come from subscribers adding services**

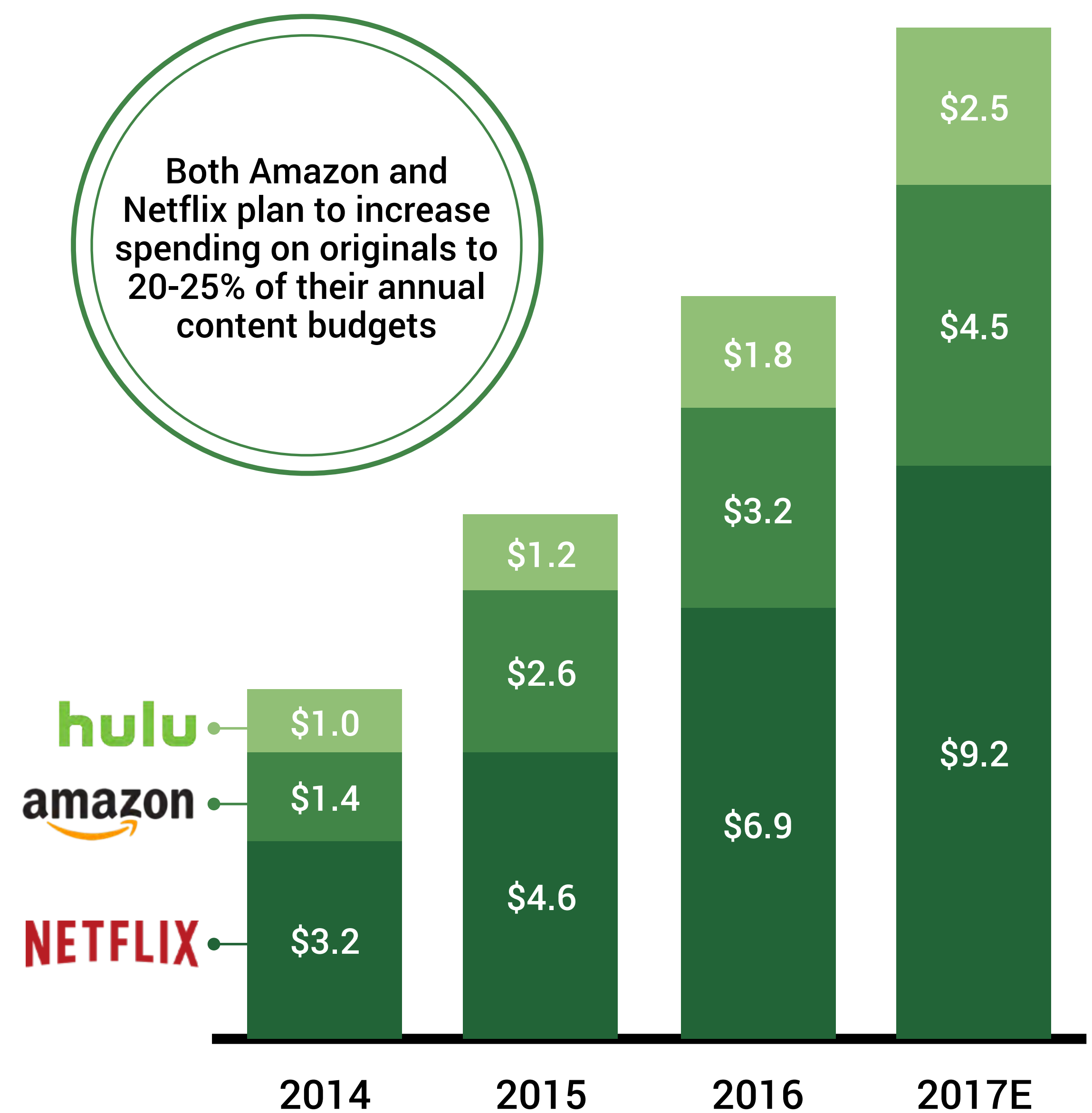
1. Aggregate across services.
Sources: Activate analysis, Activate 2016 Consumer Tech & Media Research Study (n=2,064), Activate 2017 Consumer Tech & Media Research Study (n=3,023), CNBC, GfK

For SVOD providers, library is a vehicle to acquire users, originals are to retain them

SVOD PROGRAMMING CONSIDERED MOST VALUABLE BY SUBSCRIBERS, U.S., 2017, % SUBSCRIBERS

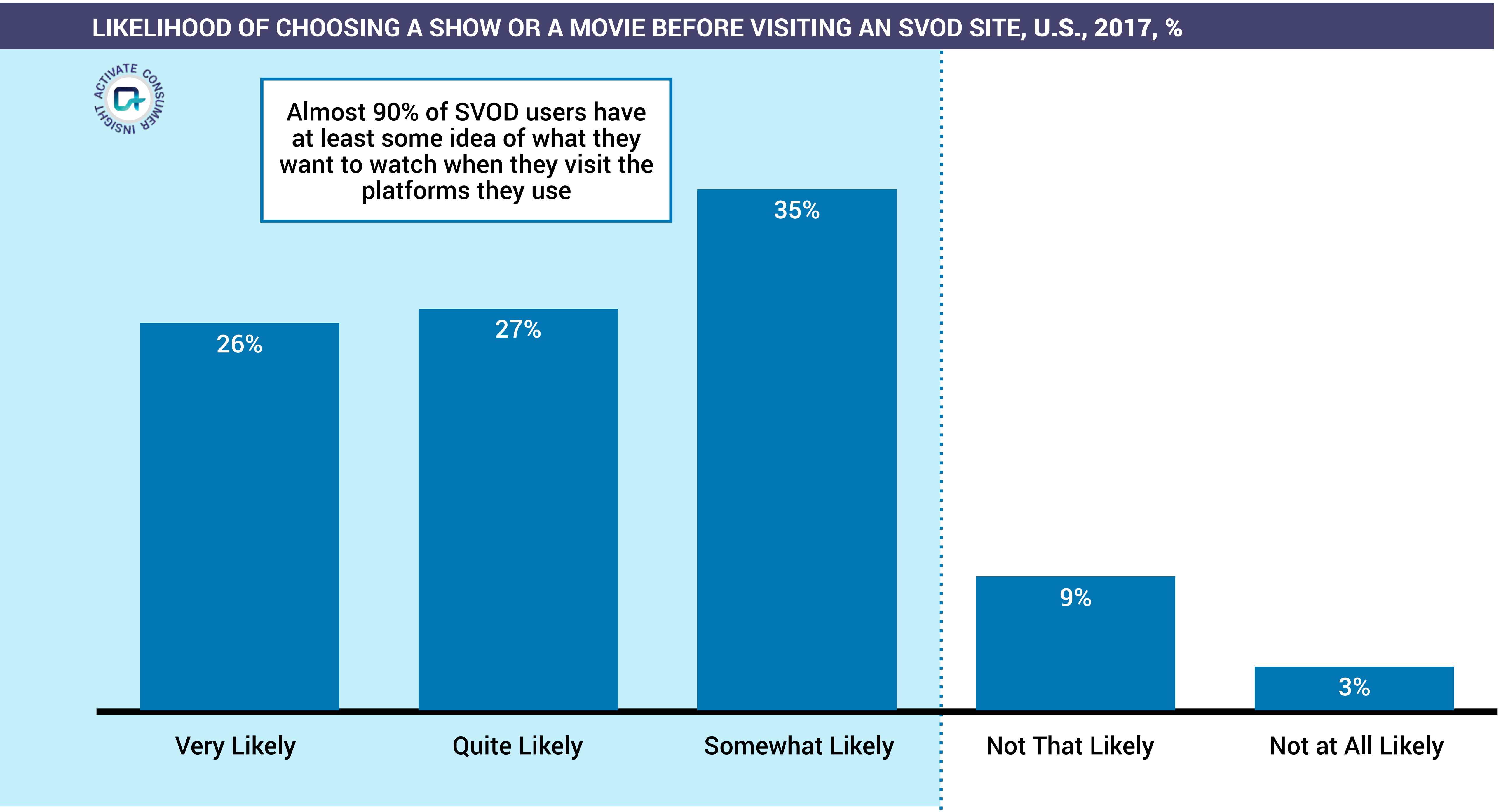


SVOD PROGRAMMING SPEND, GLOBAL, 2014-2017E, BILLIONS USD



Sources: Activate analysis, Activate 2017 Consumer Tech & Media Research Study (n=3,023), FBR, Hulu, J.P. Morgan, Netflix, RBC Capital Markets, SNL Kagan

Content owners have the ability to launch DTC services because subscribers are discerning about what they want to watch



Sources: Activate analysis, Activate 2017 Consumer Tech & Media Research Study (n=3,023)

Smaller SVOD services will face extreme consumer acquisition challenges if not acquired or distributed by established players

SELECTED AVAILABLE SVOD SERVICES, U.S., 2017

THERE WERE OVER 110 OTT SERVICES AVAILABLE TO U.S. CONSUMERS AT THE END OF 2016

RECENT SHUTDOWNS/ REVERSALS

PROGRAMMER	INITIATIVES
amazon video	• Offers more than **70 additional SVOD services** to Prime subscribers • Vehicle for expanding live into Europe
VRV	• Ellation-owned service that **combines Crunchyroll, Seeso (shutting down), Rooster Teeth, and Nerdist Alpha** • Initially **targeted toward gamers**
CBS	• **Unified Showtime and CBS bundle** for purchase directly from CBS, rather than through third-party
hulu	• Offers subscribers add-ons for **HBO, Showtime, and Cinemax** • **Partnering with Spotify** to bundle alongside music
PAY TV PROVIDERS	• Opportunity to **bundle SVOD offerings alongside traditional offerings** • Connectivity providers (e.g. telcos) can also offer **bundles of zero-rated services**

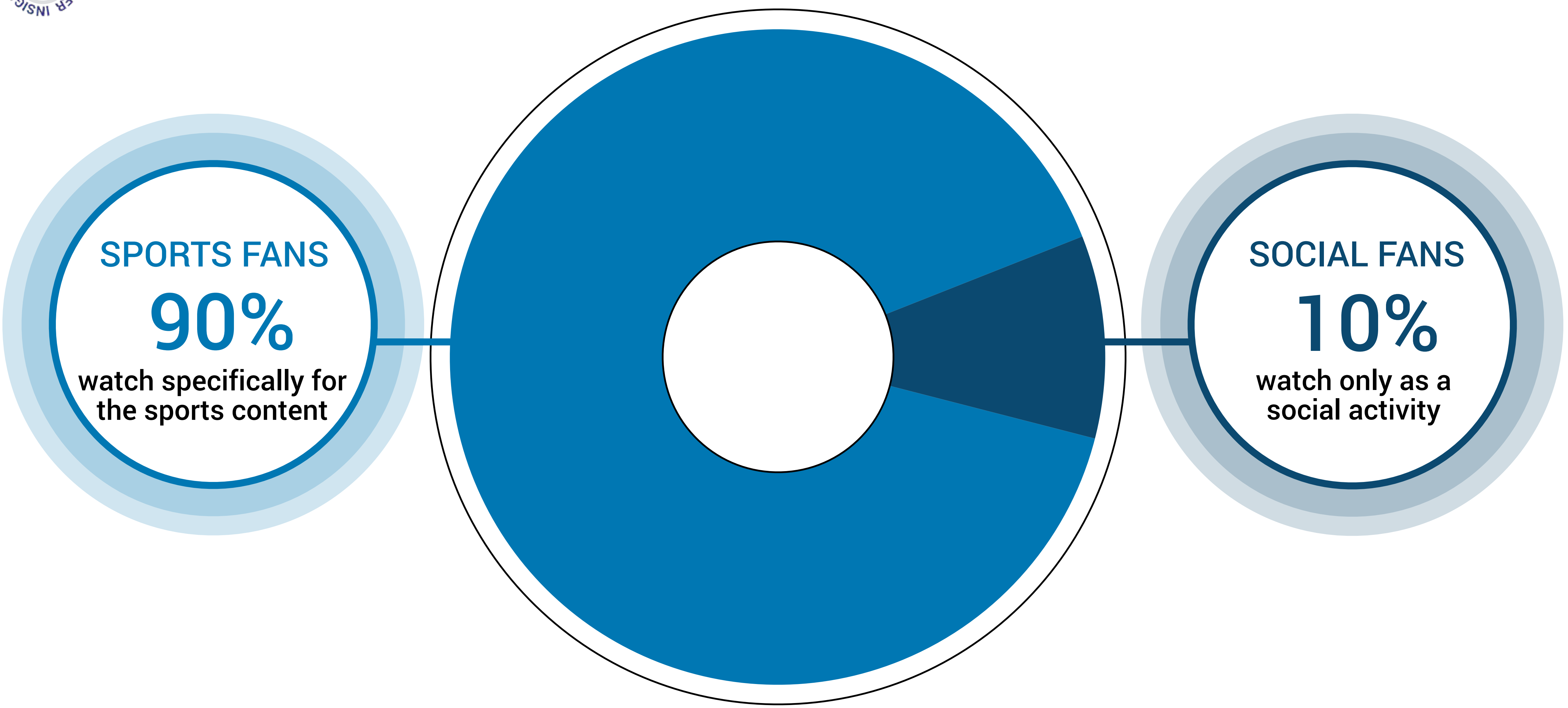
Sources: Activate analysis, Amazon, CBS, Ellation, Hulu, Parks Associates

The Most Important Insights for Tech and Media in 2018

The live TV ecosystem is built on sports: for 90% of sports viewers, there is no substitute

SPORTS VIEWER[1] SEGMENTS (ADULTS, AGE 18+, U.S., 2017)

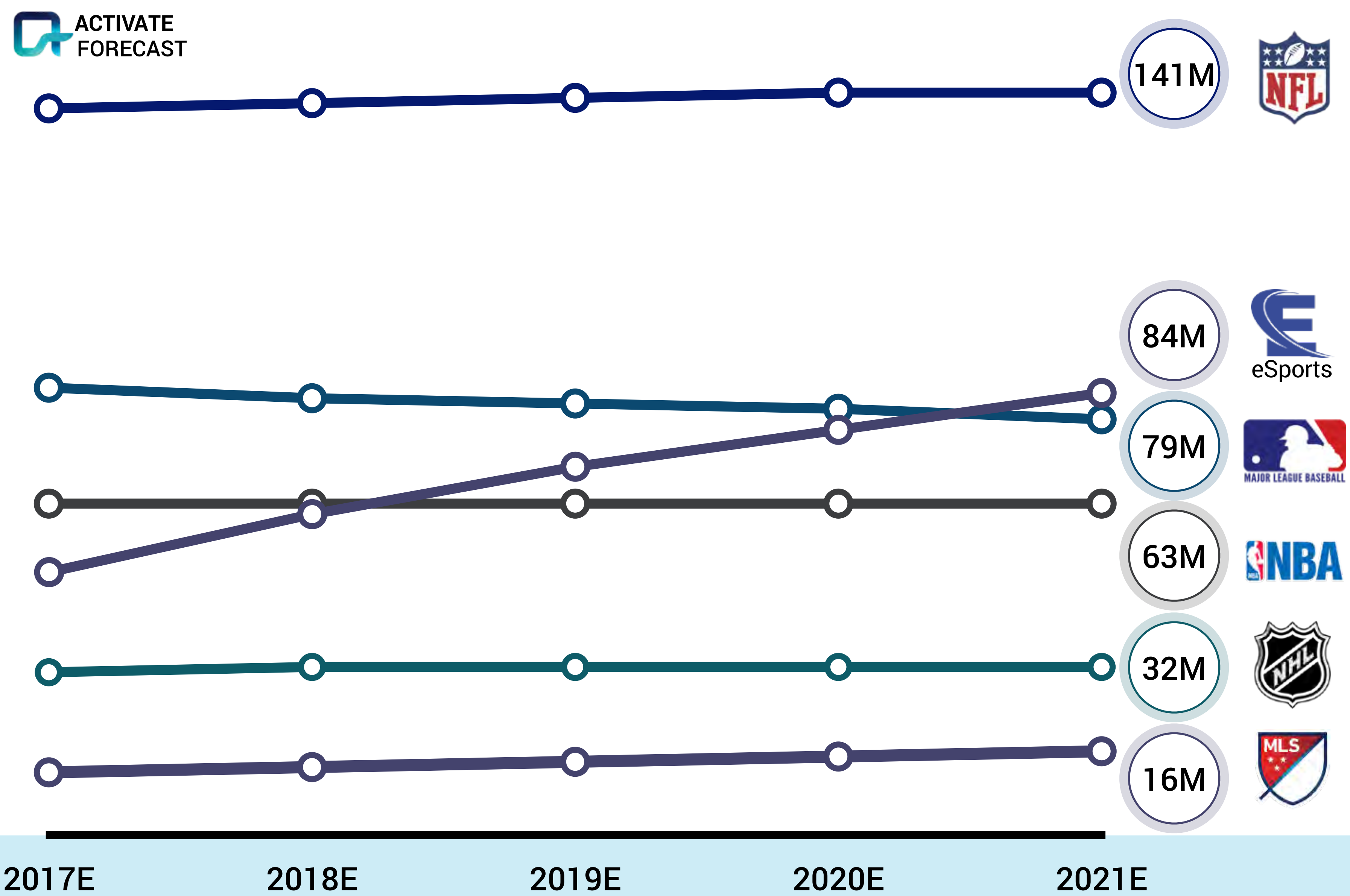
ACTIVATE CONSUMER INSIGHT



1. Sports viewers defined as anyone who reported watching sports content in a given week.
Sources: Activate analysis, Activate 2017 Consumer Tech & Media Research Study (n=2,406)

Core sports audiences will remain strong in the near future; emerging sports such as soccer and eSports will be additive

ALL SPORTS VIDEO VIEWERSHIP, U.S., 2017E-2021E, MILLIONS



~78% of sports viewers report watching at least the same amount of sports compared to last year

Sources: Activate analysis, Activate 2017 Consumer Tech & Media Research Study (Left: n=4,047; Right: n=2,406), ESPN, Forbes, NewZoo, Nielsen Scarborough, SuperData Research

However, not all viewers are created equal

ACTIVATE CONSUMER INSIGHT

SUPER FAN
Views 10+ hours of sports content per week

27% OF FANS

61% OF HOURS

86% of SUPER FANS are watching multiple sports

SUPER FANS watch ~17 hours of sports content per week on average

DEDICATED FAN
Views 5-10 hours of sports content per week

23% OF FANS

19% OF HOURS

82% of DEDICATED FANS are watching multiple sports

Football is the most popular sport among DEDICATED FANS, followed by baseball

CASUAL FAN
Views up to 4 hours of sports content per week

40% OF FANS

14% OF HOURS

~65% of CASUAL FANS are watching more than 1 sport, 2-3 on average

Football is the most popular sport among CASUAL FANS

SOCIAL FAN
Watches sports content only as a social activity

10% OF FANS

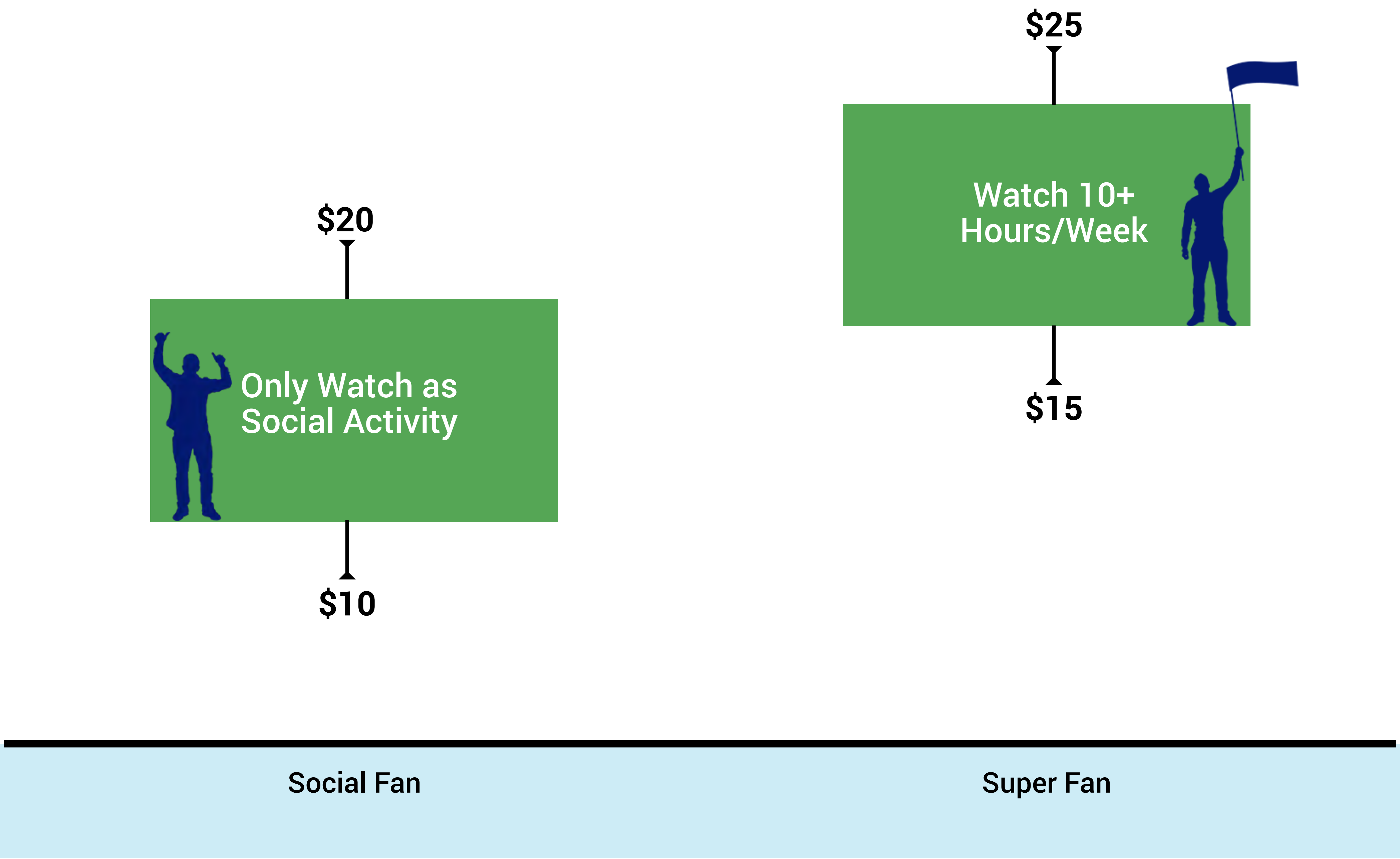
6% OF HOURS

SOCIAL FANS skew a bit older, 27% are 65+

SOCIAL FANS still watch about 4 hours of sports content per week on average

Willingness to pay aligns with fan engagement to sports: Super Fans are willing to pay over 30% more than Social Fans to access sports content

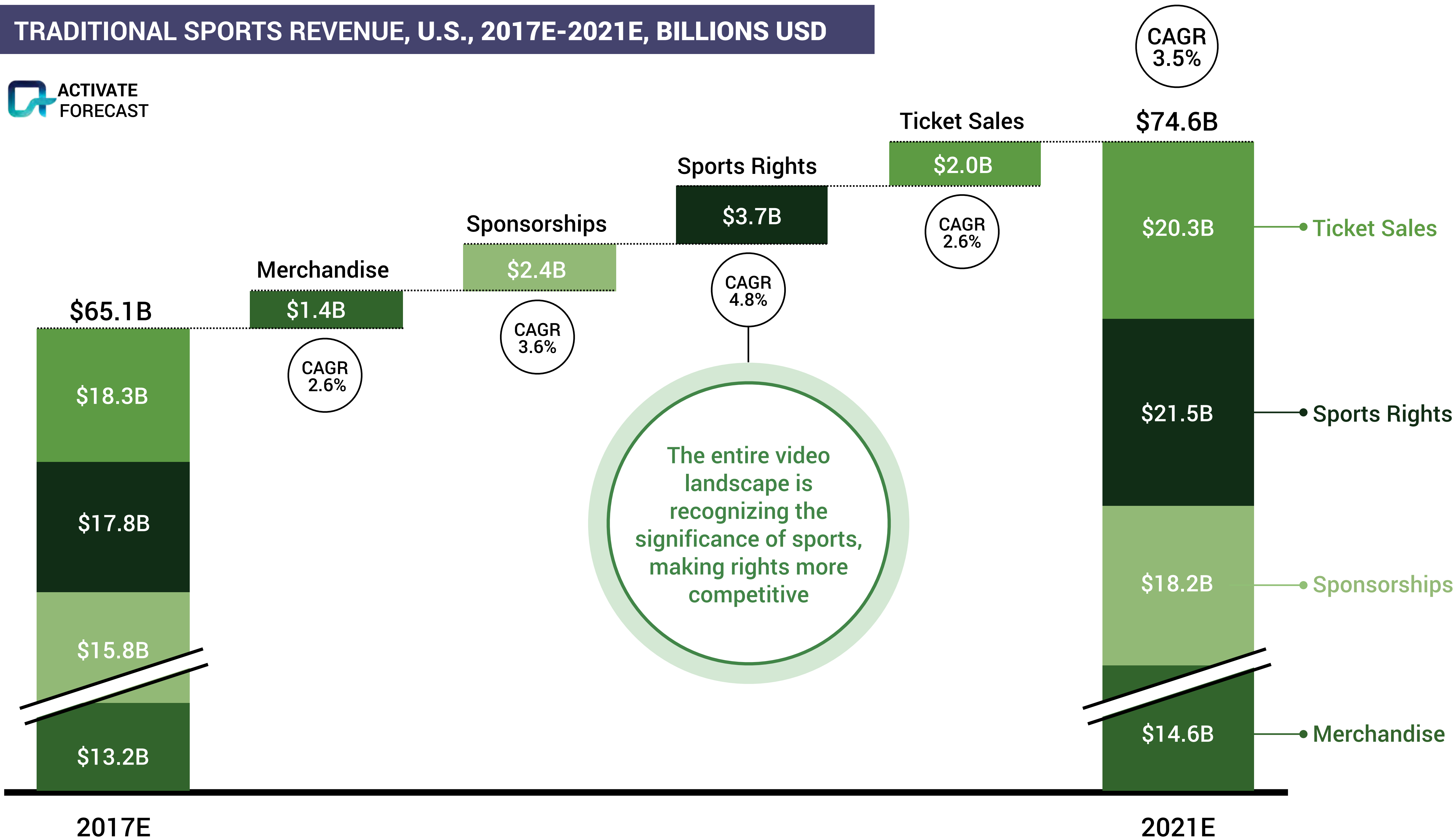
WILLINGNESS TO PAY RANGE FOR MONTHLY ACCESS[1] TO SPORTS VIDEO CONTENT BY FAN TYPE, U.S., 2017, USD



1. Access is defined as a bundle that allows viewers to watch all the sports programming across all devices.
Sources: Activate analysis, Activate 2017 Consumer Tech & Media Research Study (n=2,406)

Built on the strong demand of sports fans, sports rights will continue to drive revenue growth for sports

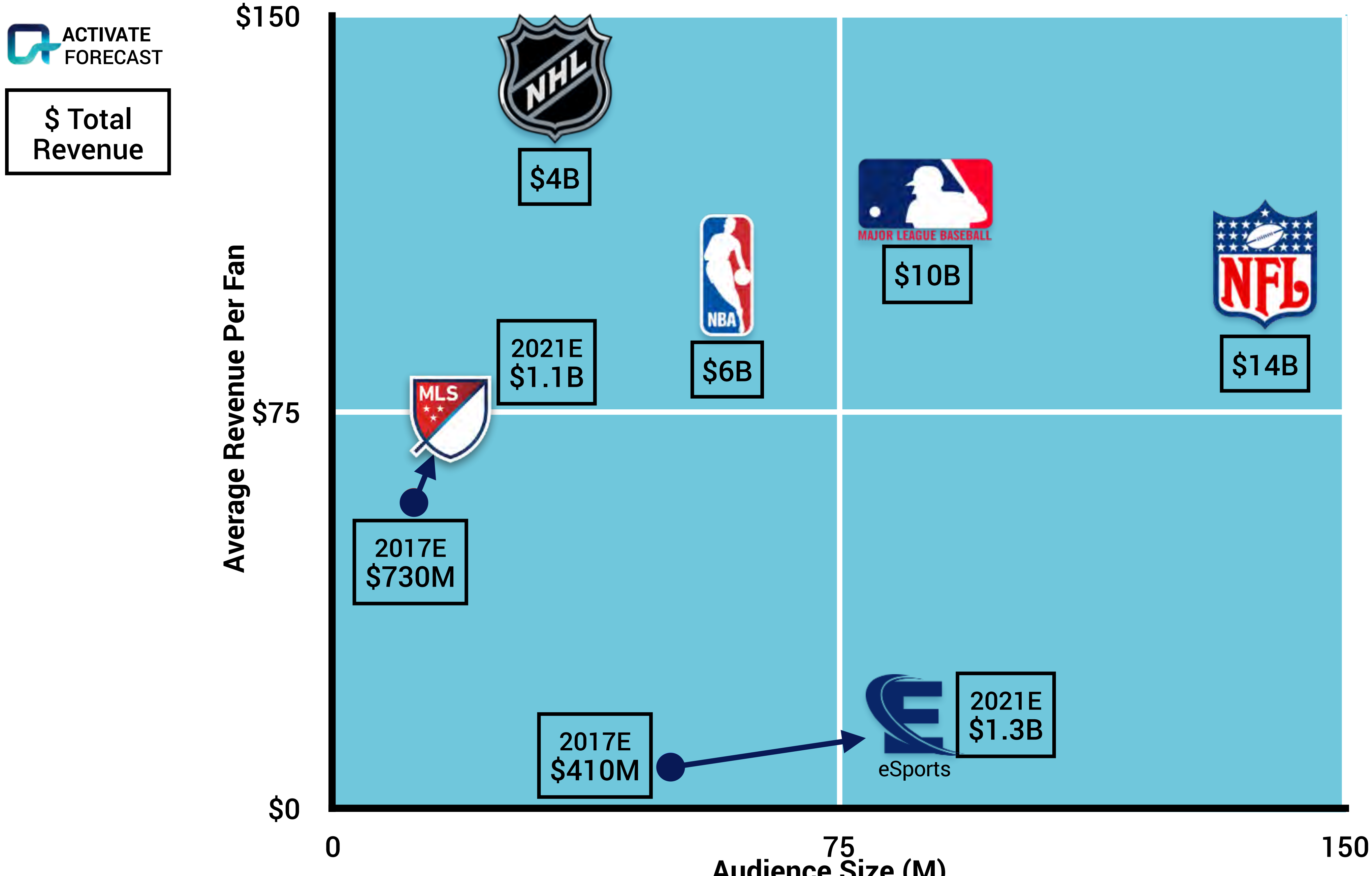
TRADITIONAL SPORTS REVENUE, U.S., 2017E-2021E, BILLIONS USD



Sources: Activate analysis, Company financials, Company press releases, IEG, International Monetary Fund, PricewaterhouseCoopers, SNL Kagan, Wall Street Journal

On top of today's growing sports revenues, new venues for further growth will include emerging leagues such as MLS and eSports

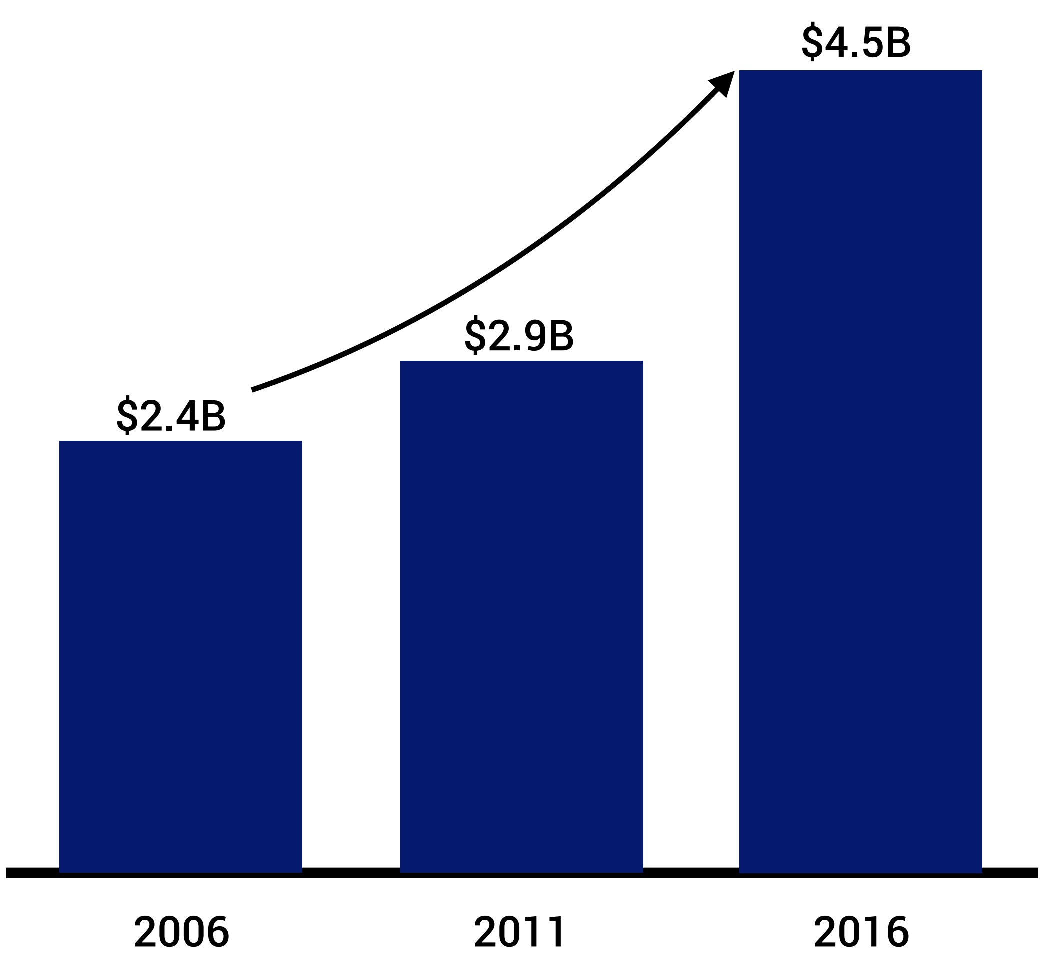
REVENUE AND AUDIENCE SIZE, U.S., 2017E[1], USD AND MILLION VIEWERS



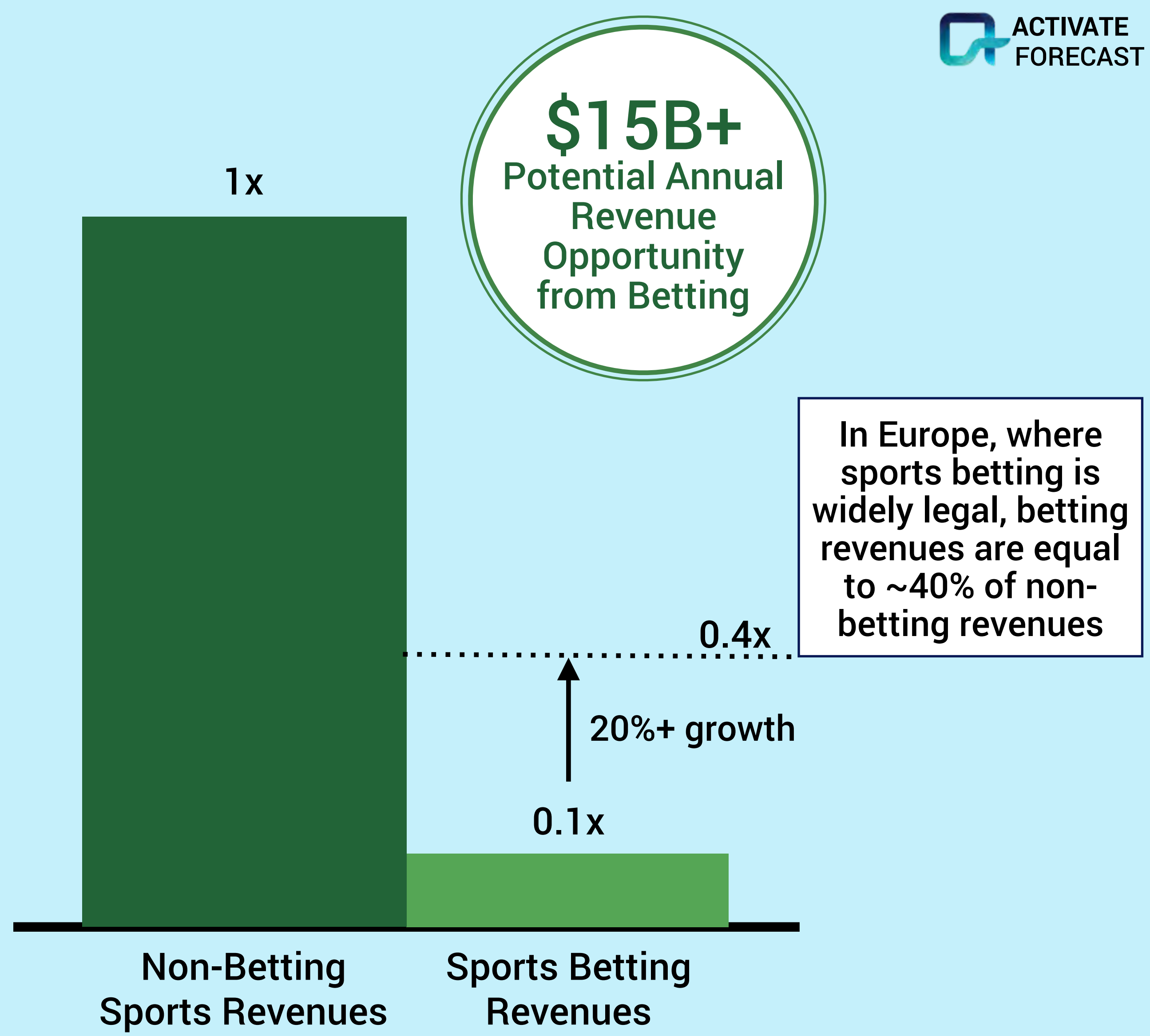
1. eSports and MLS also include 2021E.
Sources: Activate analysis, Activate 2017 Consumer Tech & Media Research Study (n=4,047), ESPN, Forbes, NewZoo, Nielsen Scarborough, SuperData Research

There is growing interest for sports betting in the U.S., we forecast that nationwide legalization could mean significant revenues

NEVADA SPORTS BETTING AMOUNT BY YEAR, U.S., 2006-2016, BILLIONS USD



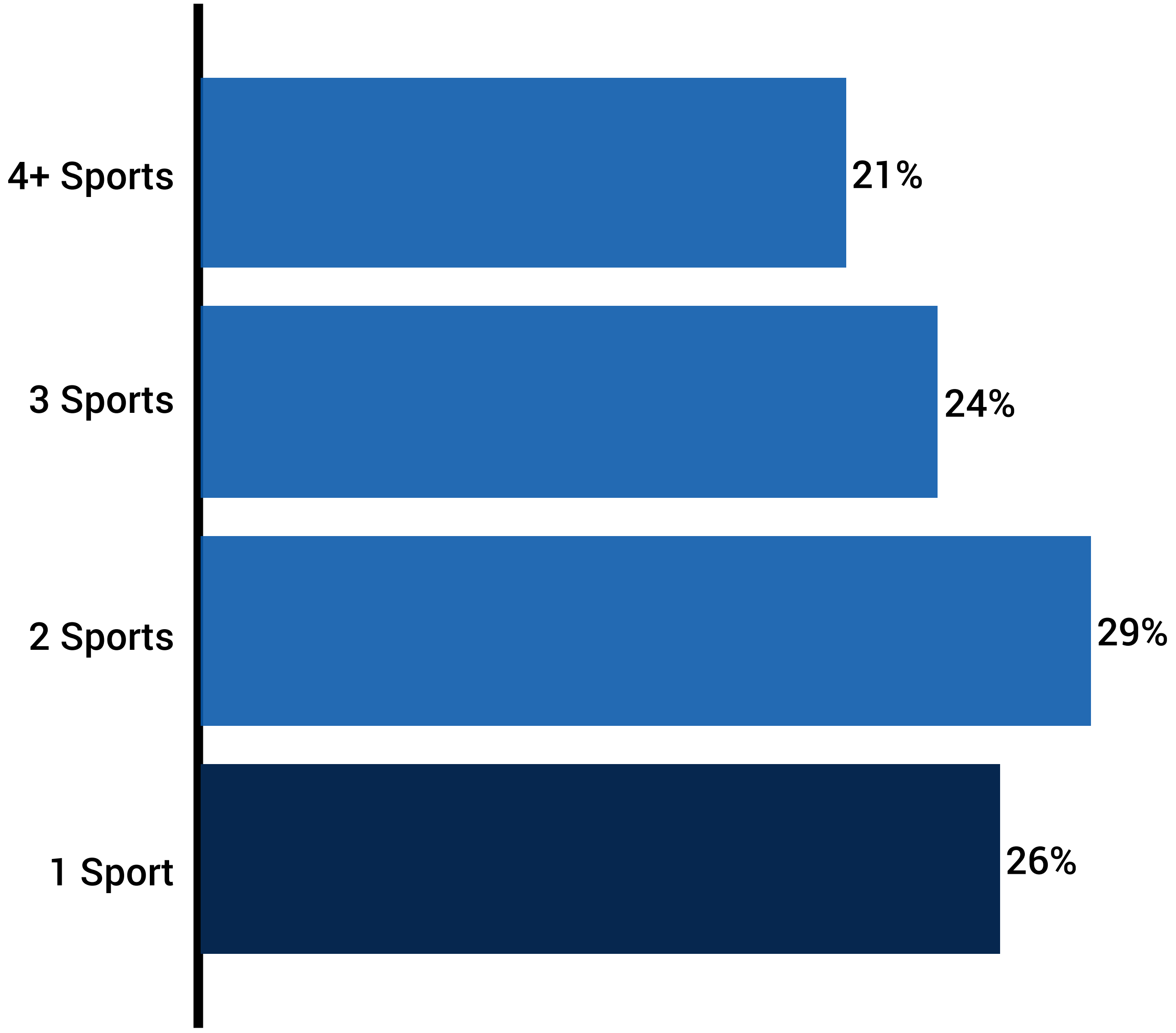
SPORTS REVENUES VS. SPORTS BETTING REVENUES, U.S., 2017E, RATIO

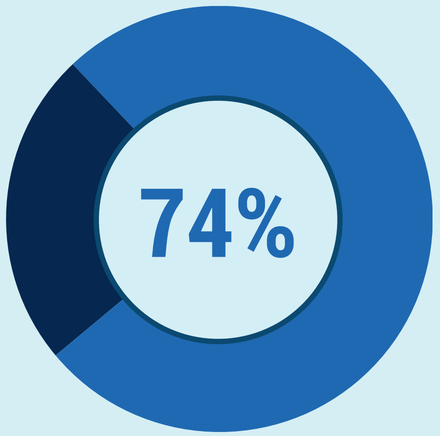


Sources: Activate analysis, American Gaming Association, H2 Gambling Capital, PricewaterhouseCoopers, University of Nevada

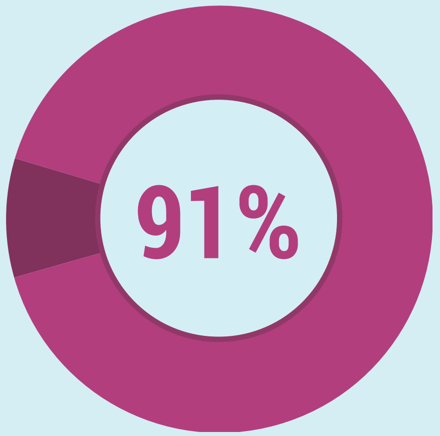
Most sports fans will continue to follow multiple sports

NUMBER OF SPORTS WATCHED BY SPORTS VIEWERS, U.S., 2017, % VIEWERS





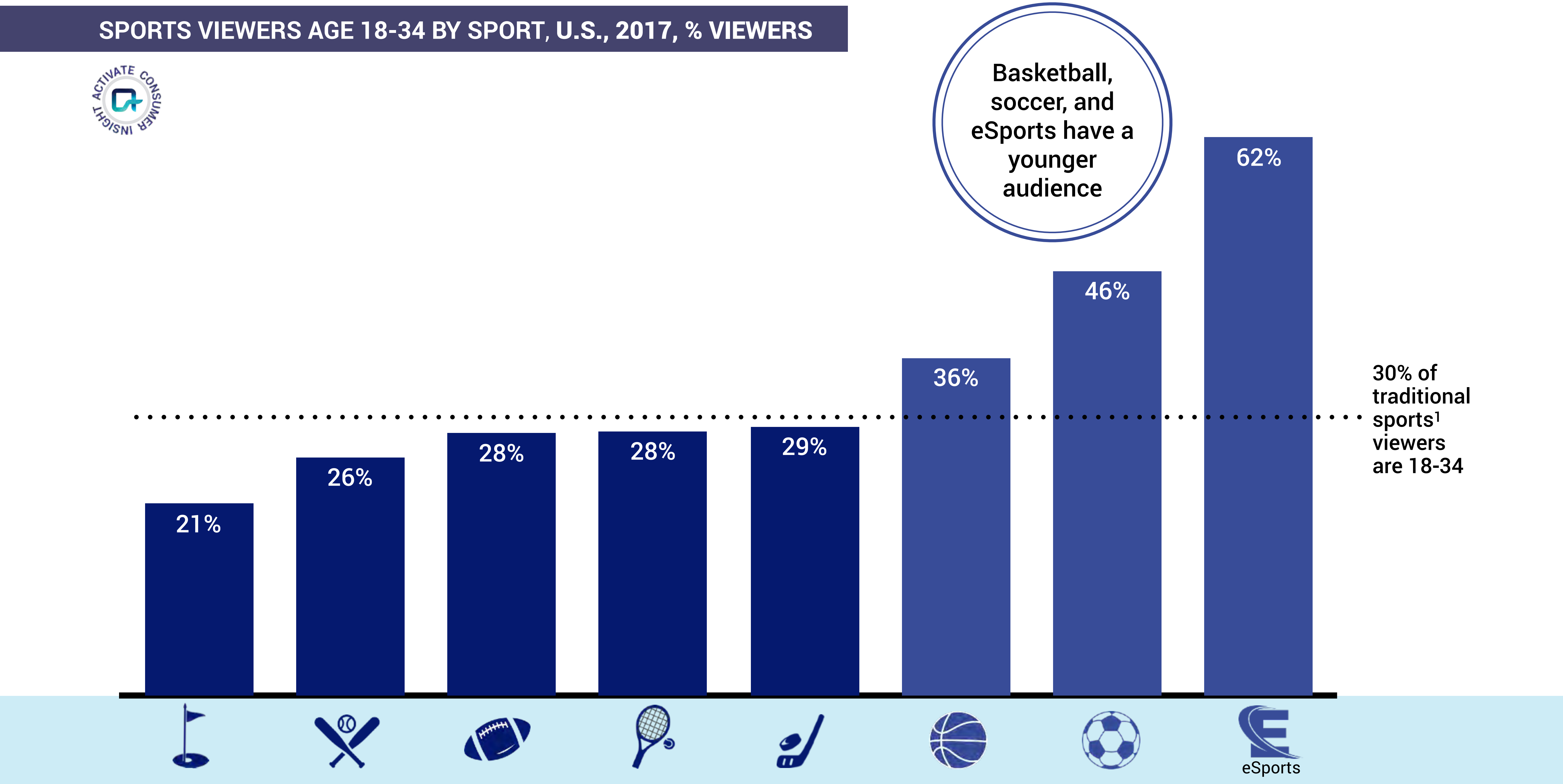
of sports viewers follow more than 1 sport



of eSports enthusiasts also follow or play traditional sports

Sources: Activate analysis, Activate 2017 Consumer Tech & Media Research Study (n=2,406), Activate 2016 Consumer Tech & Media Research Study (n=1,178)

Younger fans will drive viewership towards emerging leagues such as MLS and eSports



1. Traditional sports are comprised of football, baseball, basketball, hockey, etc.
Sources: Activate analysis, Activate 2017 Consumer Tech & Media Research Study (n=2,406)

TV will continue to be the dominant platform for sports viewing, but digital platforms will gain importance as younger generations age

SHARE OF SPORTS VIEWERS WATCHING SPORTS ON EACH PLATFORM BY AGE, U.S., 2017, % VIEWERS

ACTIVATE CONSUMER INSIGHT

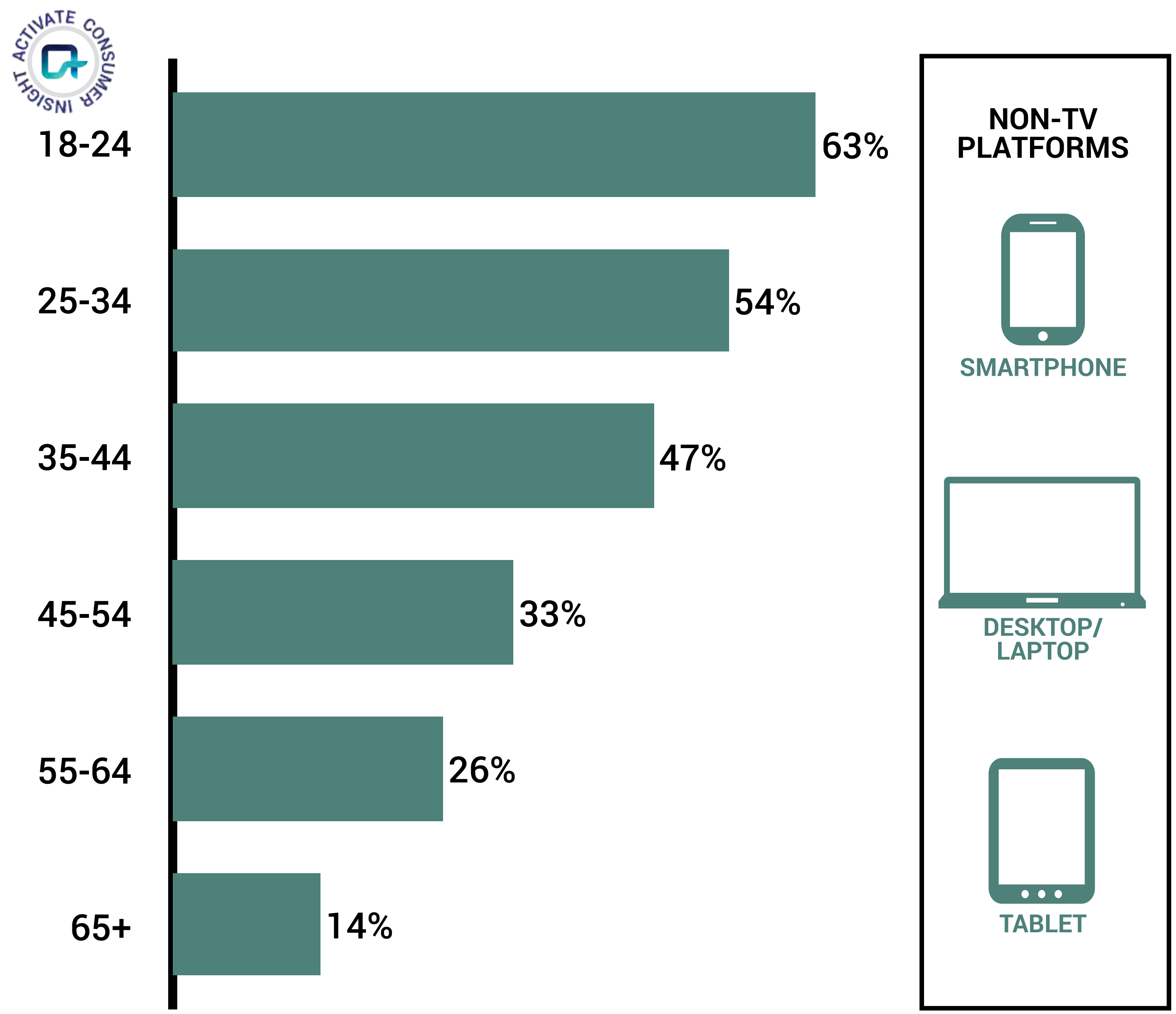
Younger viewers are watching on multiple platforms

	18-24	25-34	35-44	45-54	55-64	65+
TV	87%	94%	92%	95%	97%	99%
SMARTPHONE	42%	38%	31%	14%	10%	2%
DESKTOP/ LAPTOP	38%	32%	26%	22%	16%	12%
TABLET	13%	17%	18%	13%	8%	3%

Sources: Activate analysis, Activate 2017 Consumer Tech & Media Research Study (n=2,406), Nielsen

Audience reach will cross over multiple platforms, particularly for younger viewers

SHARE OF SPORTS VIEWERS WATCHING SPORTS ON NON-TV PLATFORMS BY AGE, U.S., 2017, % VIEWERS



266K
AVG VIEWERS PER STREAMED TNF[1] GAME IN 2016 (WORLDWIDE)

372K
AVG # OF VIEWERS THAT WATCHED FIRST TNF[1] GAME IN 2017 (WORLDWIDE)

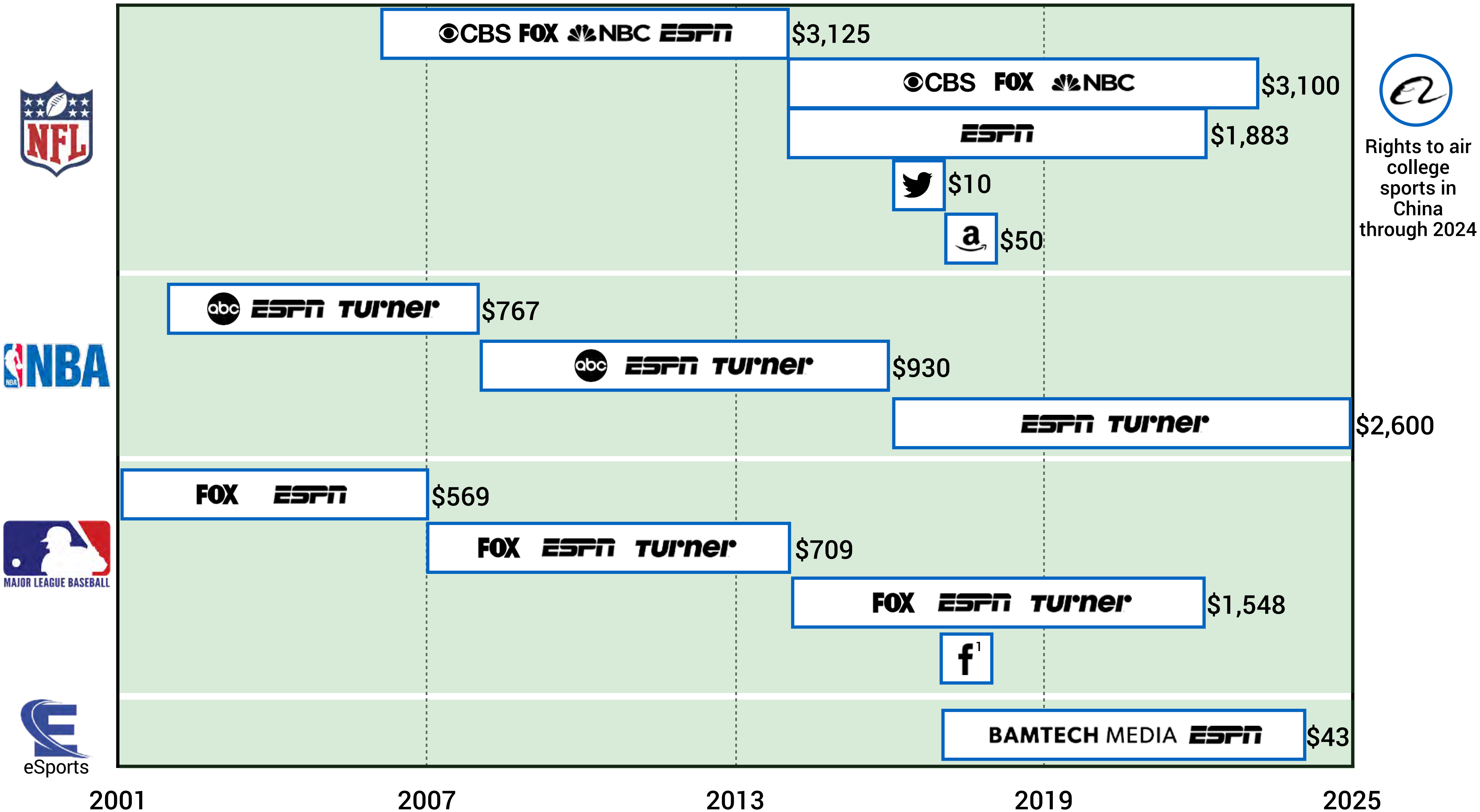
NFL SUNDAY TICKET

8M+
U.S. DOWNLOADS SINCE 2010

1. Thursday Night Football.
Sources: Activate analysis, Activate 2017 Consumer Tech & Media Research Study (n=2,406), AppAnnie, Bloomberg, CBS, comScore

The next years will see extreme competition for rights among media companies and digital platform insurgents

SELECT CONTENT RIGHTS TIMELINES PER SPORT PER YEAR, U.S., 2001-2025, MILLIONS USD

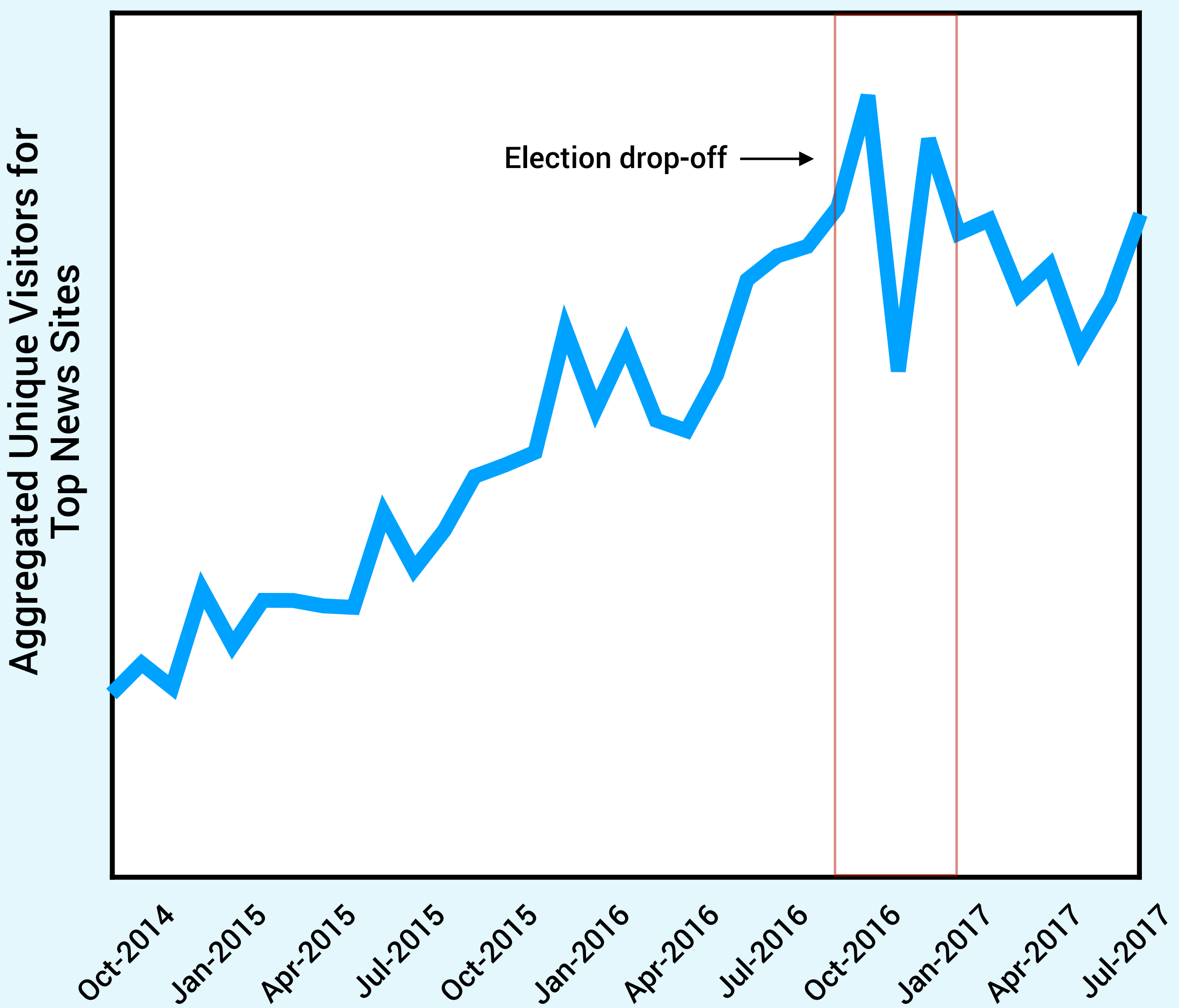


1. Financials not disclosed.
Sources: Activate analysis, Company and league press releases, SNL Kagan, Wall Street Journal

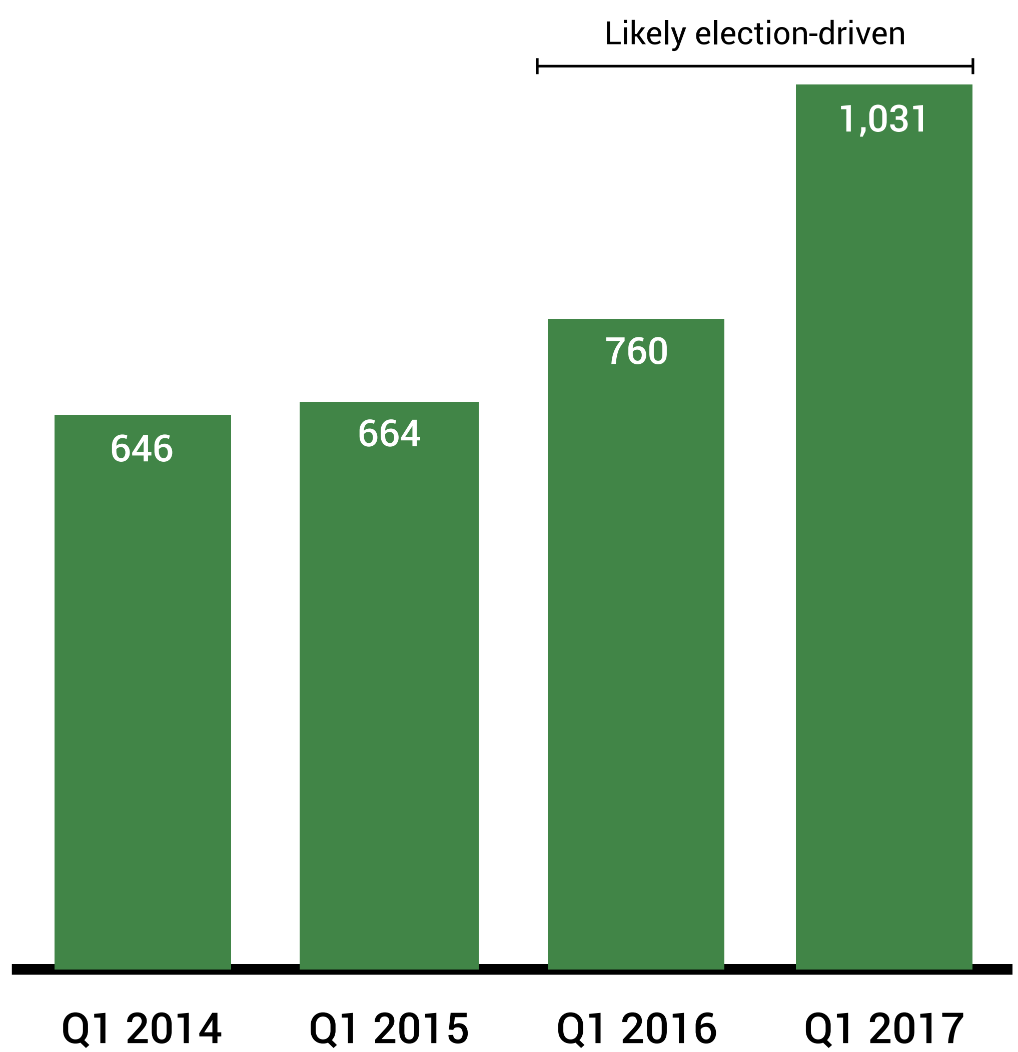
The Most Important Insights for Tech and Media in 2018

Digital news consumption has grown over the last three years, while television news engagement has climbed – this is more than just the bump from the election

MULTI-PLATFORM TRAFFIC TO TOP NEWS PROPERTIES, U.S., OCT 2014-JUL 2017, BILLION AGGREGATED MONTHLY UNIQUE VISITORS[1]



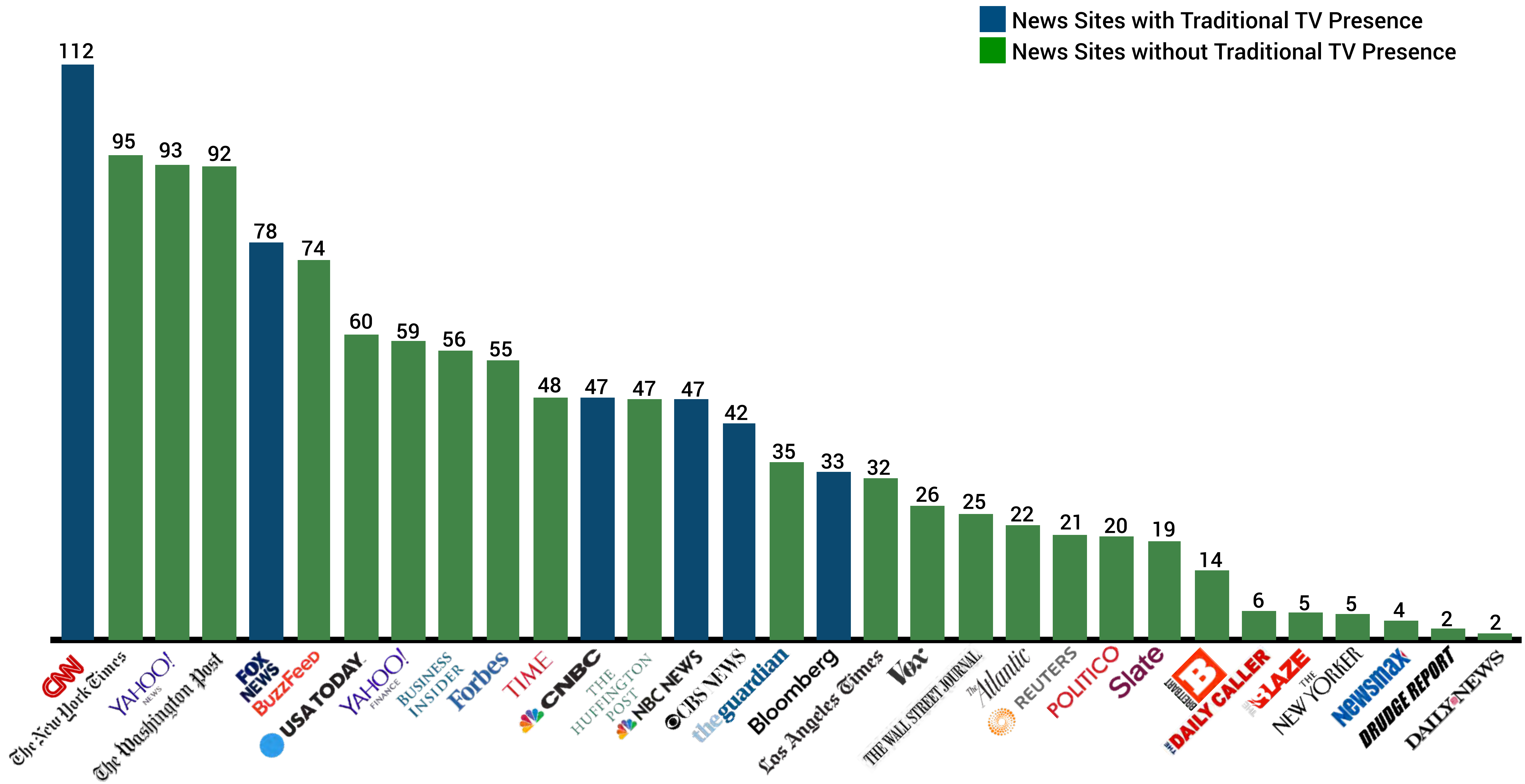
AVERAGE ENGAGEMENT FOR TOP NEWS CHANNELS, U.S., Q1 2014-2017, TOTAL MINUTES VIEWED[2]



1. Based on individual news properties in top 100 of comScore news rankings, includes desktop site, mobile site and mobile app. Aggregated monthly unique visitors defined as a sum of MUVs from comScore's top 100 news properties.
2. Average viewership minutes measured for ABC, CBS, NBC, CNBC, CNN, Fox Business Network, Fox News Channel, PBS, and The Weather Channel for Q1 2014-2017.
Sources: Activate analysis, comScore, Nielsen

The digital properties that command the largest audiences have a strong presence on multiple platforms, particularly television

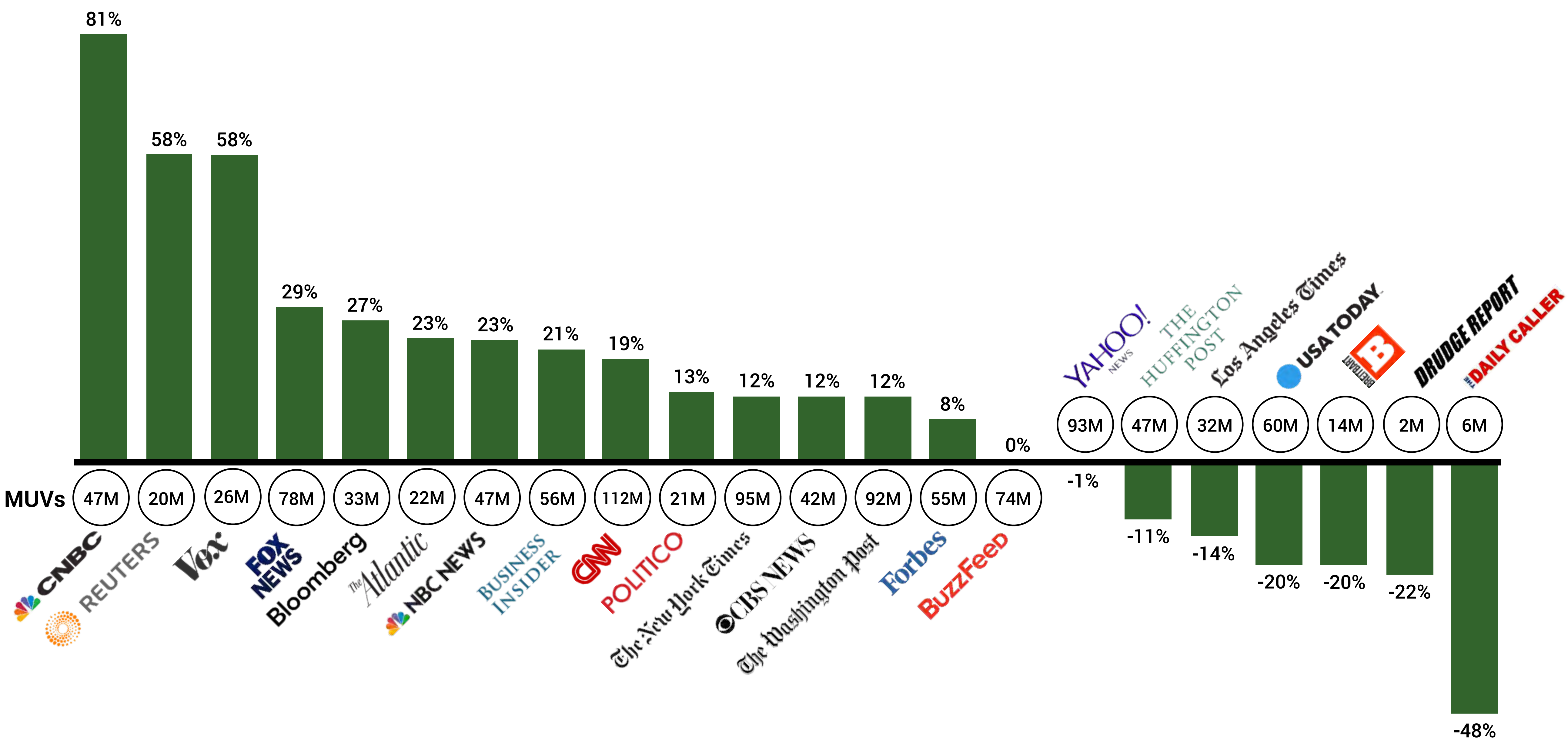
TRAFFIC TO SELECTED TOP NEWS SITES, U.S., AUG 2017, MILLION MONTHLY UNIQUE VISITORS[1]



1. Top news sites are selected from comScore's Top 100 digital news properties, all sites represent desktop and mobile site numbers only.
Sources: Activate analysis, Alexa, comScore

Over the last year, there have been major shifts in traffic across leading news sites

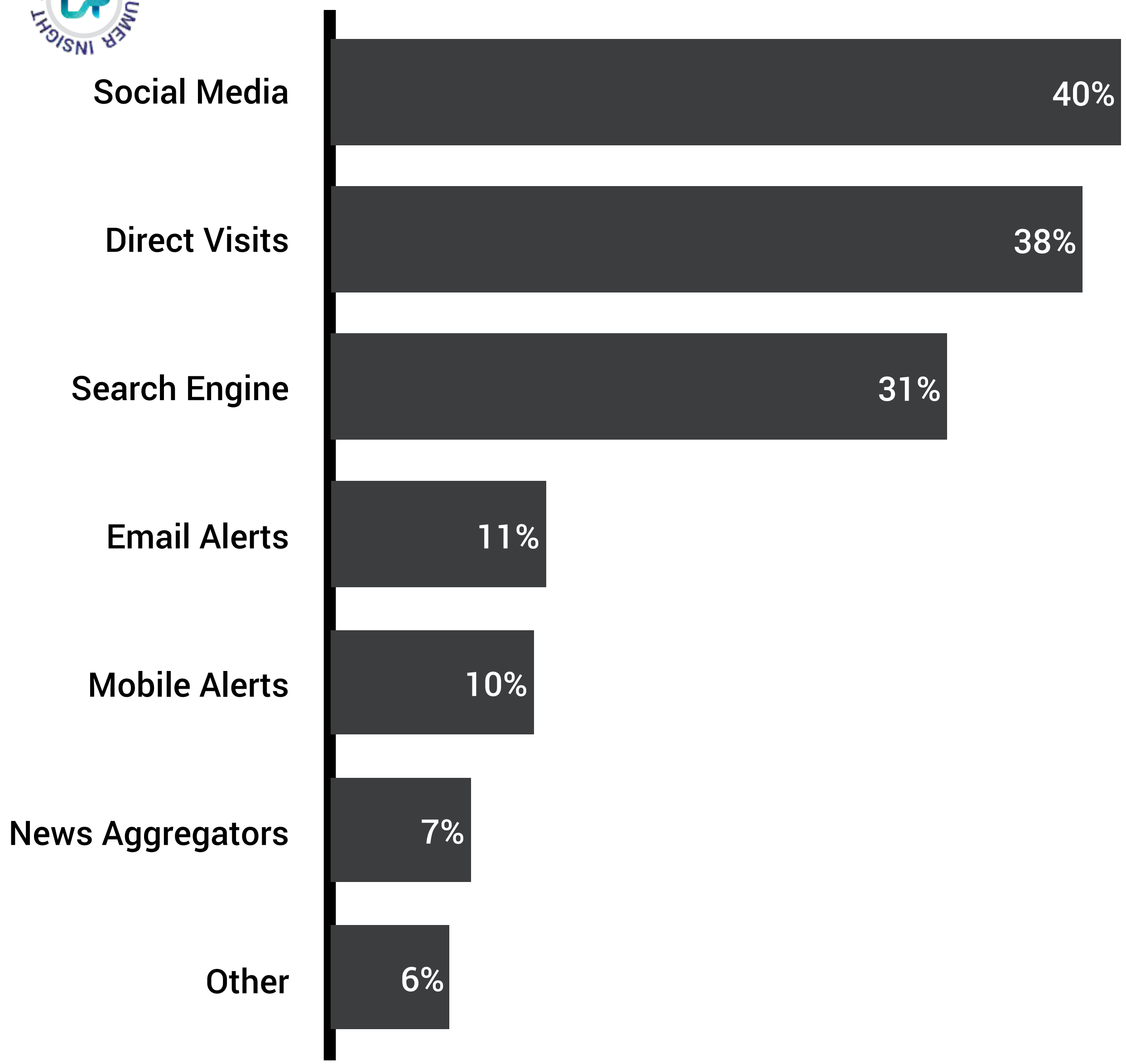
GROWTH FOR TOP NEWS SITES, U.S., AUG 2016-2017, % CHANGE IN MONTHLY UNIQUE VISITORS[1]



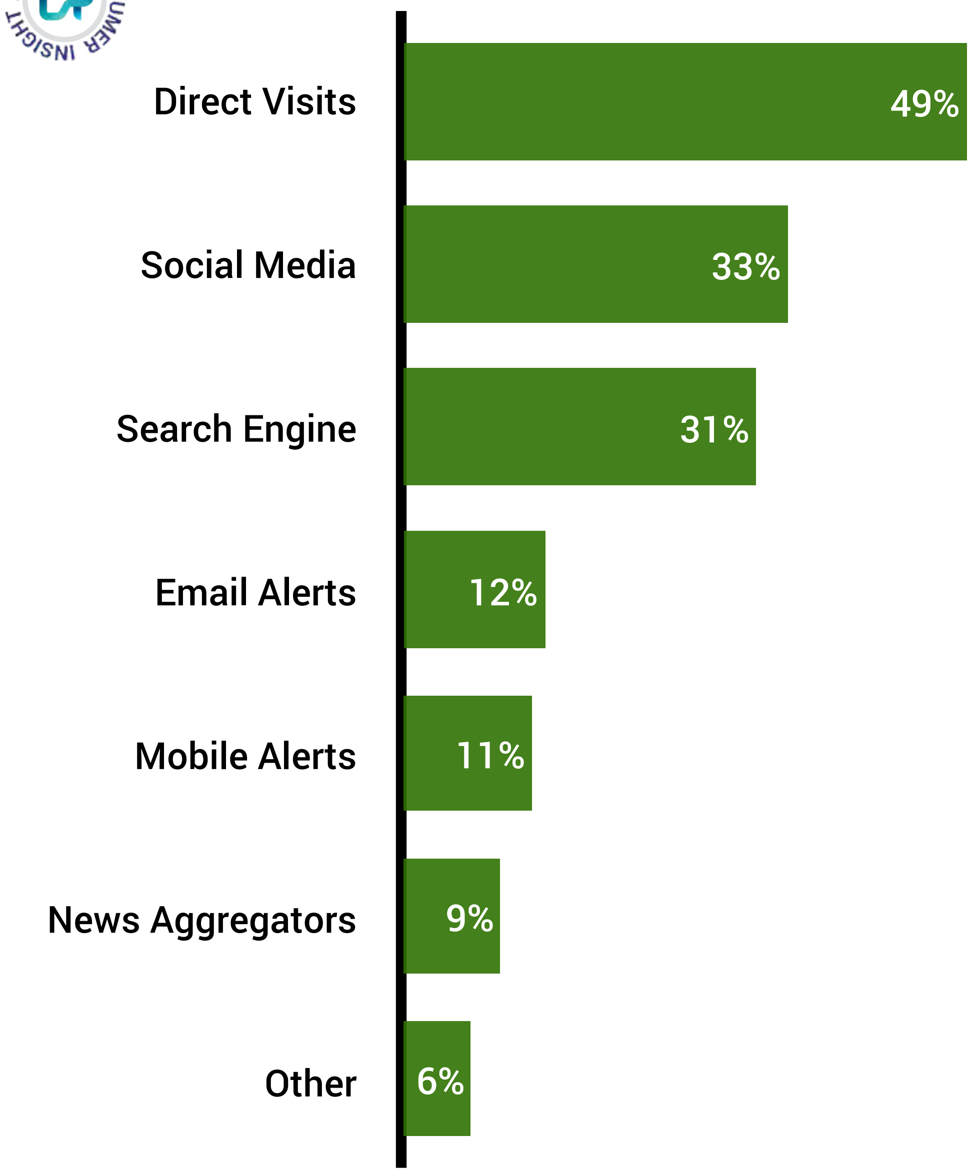
1. Top news sites are selected from comScore's Top 100 digital news properties, all sites represent desktop and mobile site numbers only.
Sources: Activate analysis, Alexa, comScore

Social has become the leading discovery source, but the importance of direct visits suggests that news brands are durable

SOURCES OF NEWS DISCOVERY, U.S., 2017, % ADULTS



NEWS CONSUMERS ACTIVELY SEARCHING FOR NEWS, U.S., 2017, % ACTIVE NEWS READERS



Sources: Activate analysis, Activate 2017 Consumer Tech & Media Research Study (Left: n=4,047; Right: n=2,013)

News companies and social platforms will continue to partner to reach new audiences

MAJOR NEWS SHOWS ON SNAPCHAT, U.S., 2017

PUBLISHER-NEWS VIDEO PARTNERSHIPS, U.S., 2017

Twitter

- Planning **16 streaming video partnerships**, including a show with **BuzzFeed (MorningFeed)** and a technology news show with **The Verge (Circuit Breaker)**
- Also working with **Cheddar to launch an hour-long daily show (Opening Bell)** that will focus on financial and business news

Facebook

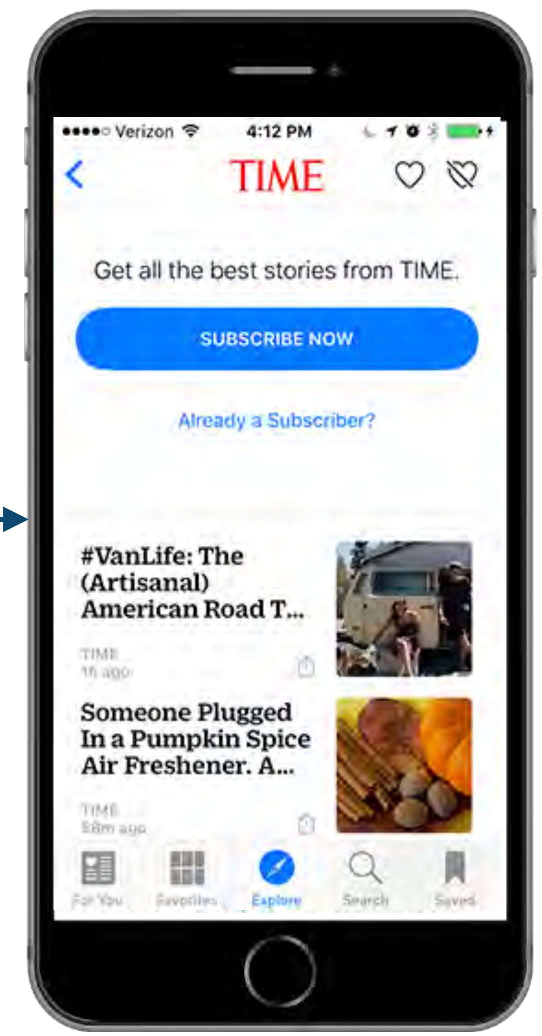
- Shifting away from incentive program for live video, and **encouraging news publishers to create premium, long-form video content**
- Currently testing **"Instant Video" feature to allow news publishers to create fast-loading, mobile-friendly video** that does not require mobile data

Sources: Activate analysis, CNN, Fortune, NBC, Snapchat, TechCrunch

Platforms have loosened attempts to control news revenue streams, but are still holding back on consumer data and transparency in discovery

INITIATIVES BY FIRST-PARTY PUBLISHING PLATFORMS, U.S., 2017

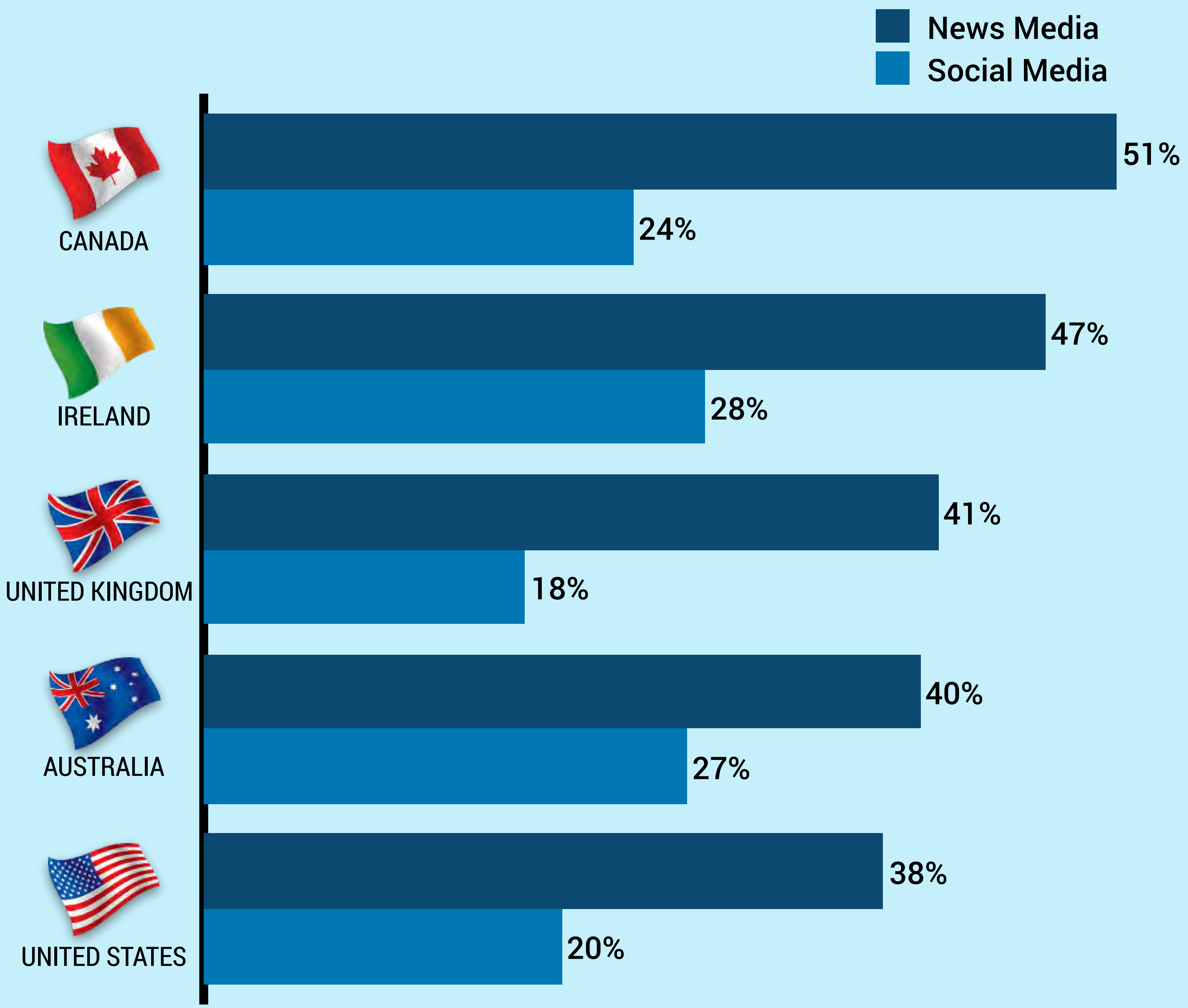
			[1]
SUBSCRIPTION	Planned subscription and newsletter tools, possibly with **metered paywall capability**	Testing of subscription tools (**"first click free"** option sunset in favor of "flexible" option that lets publishers meter paywalls)	**Featured subscriptions capability** for select publications (e.g. TIME)
ADVERTISING	Changes allow publishers to **show more ads**, and insert **"call-to-action" newsletters**	Video ad capability alongside Moat attribution and measurement — **advertisers get full sense of ad revenue**	Reportedly **open to letting publishers sell ads** through their own stack, with NBCU currently handling sales
CONSUMER DATA	**Control of consumer data** has prompted publishers to pool own audience data	**Broader accounting** of traffic data through expected DoubleClick enhancements such as BigQuery and Data Studio, along with **Moat video measurement**	Controls **consumer data on payment**
DISCOVERY	**Prefers publishers using Instant Articles** and **Facebook Live** tools	Dominance in search means **AMP pages receive preference within search**	**"Featured Subscriptions"** for certain publishers



1. Apple News.
Sources: Activate analysis, Business Insider, Digiday, Mashable, TechCrunch, Wall Street Journal, Wired

Social platforms will need to maintain relationships with credible news media brands to continue as reliable news sources

PERCEIVED TRUSTWORTHINESS BY NEWS SOURCE, SELECTED COUNTRIES, 2017, % NEWS READERS



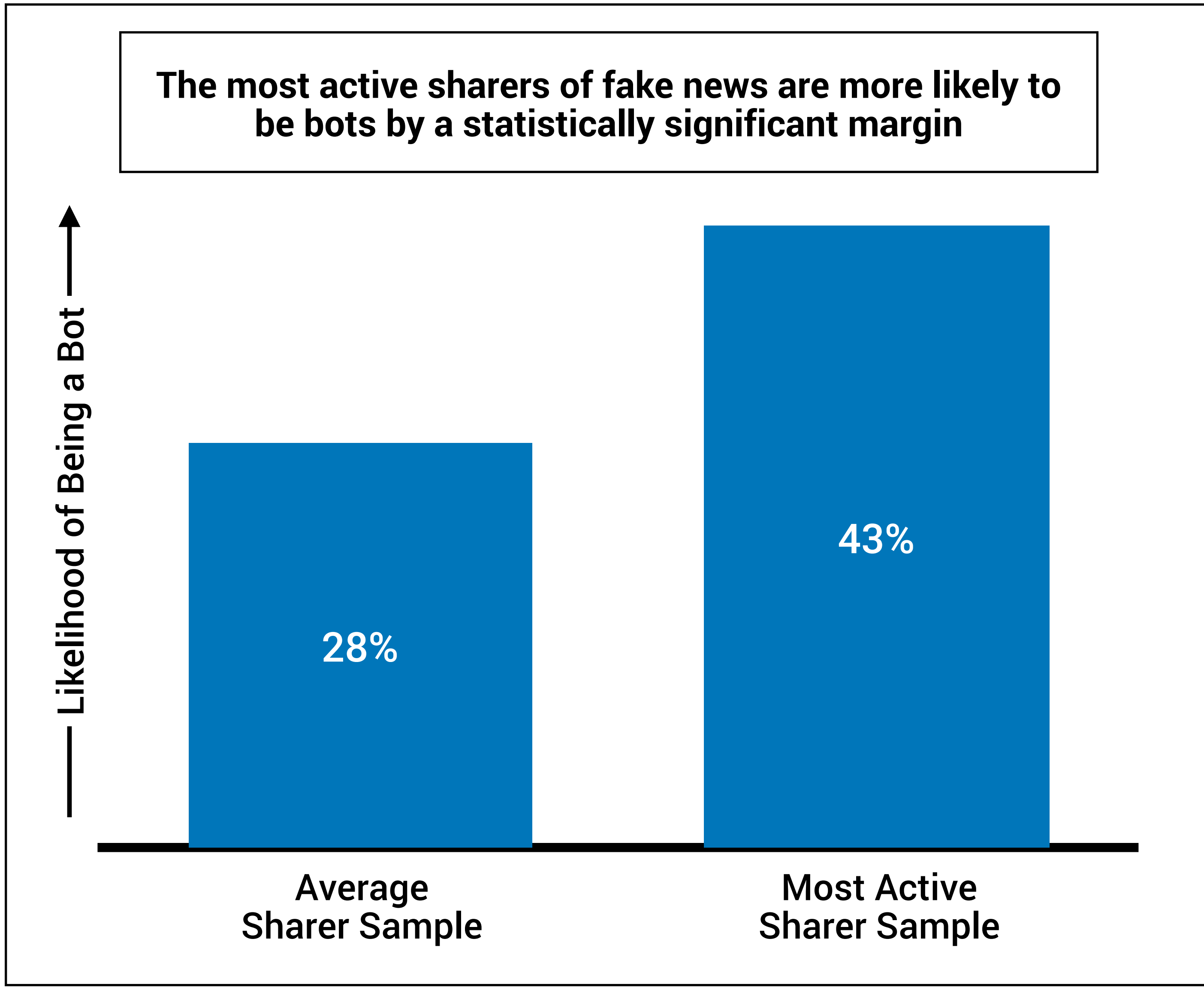
ESTABLISHED PUBLISHERS WITH MINIMAL INSTANT ARTICLES PARTICIPATION

PUBLISHERS THAT HAVE LEFT OR REMAIN UNINVOLVED	QUARTZ theguardian The New York Times
PUBLISHERS WITH MINIMAL INVOLVEMENT	Los Angeles Times VICE THE WALL STREET JOURNAL. Chicago Tribune

Sources: Activate analysis, Columbia Journalism Review, Digiday, Reuters, Tow Center for Digital Journalism, The Verge

"Fake friends" — or bots on social platforms — appear to drive fake news, and are likely to be the most active distributors of false content

LIKELIHOOD OF FAKE NEWS SHARER BEING A BOT, GLOBAL, 2017, BOT SCORE[1]



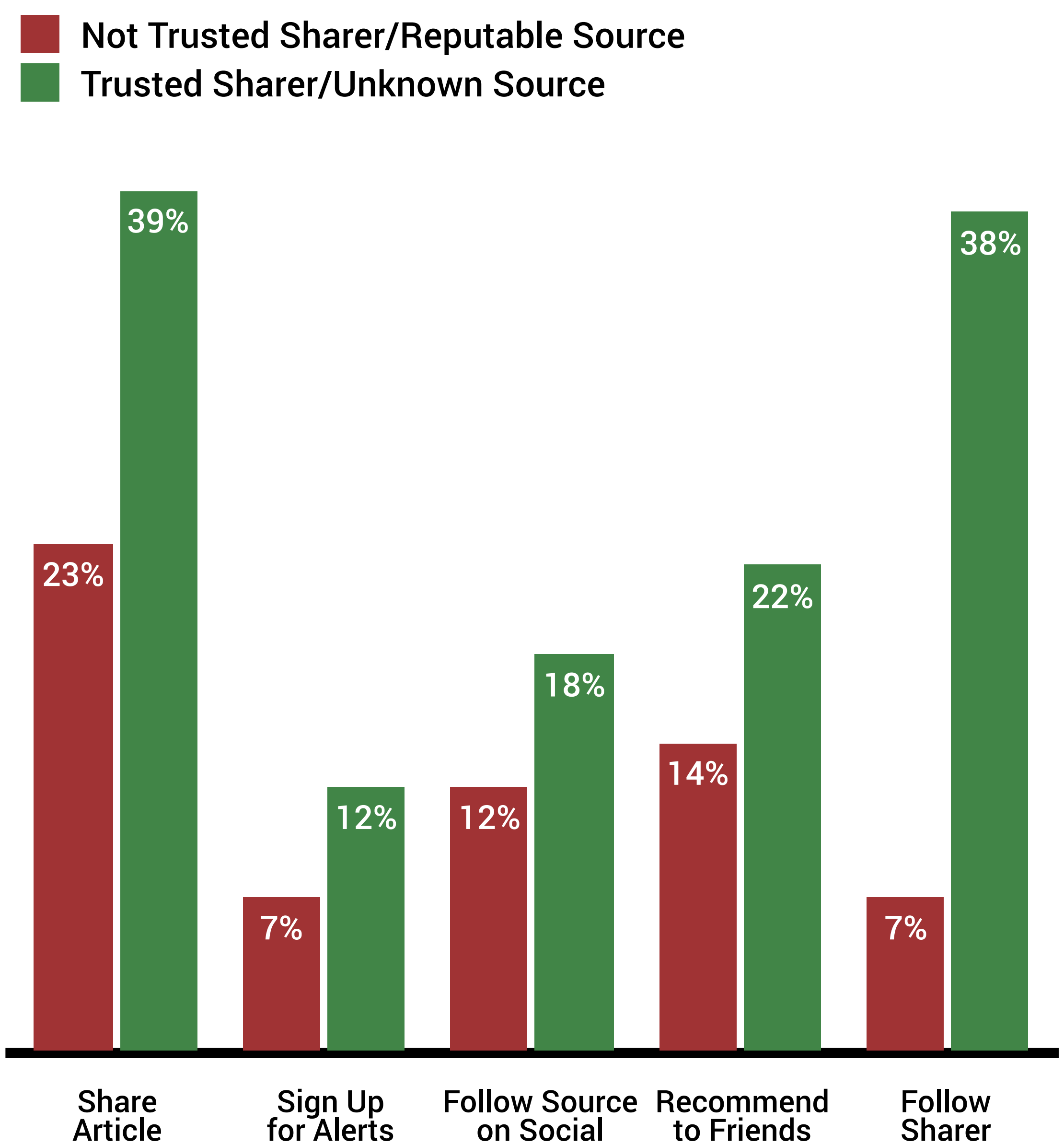
TAKEAWAYS

- Researchers analyzed **14 million messages spreading 400,000 claims on Twitter** during and following the presidential election
- **The most active sharing accounts are 15% more likely to be bots** (see left) than a social account chosen at random
- The findings highlight the **importance of efforts to curb "fake accounts" or "fake friends" on social platforms**, either as a replacement for or supplement to existing efforts to flag fake news content

1. Bot score measures likelihood that a given social account is controlled by a bot. The Indiana University methodology collects up to 200 of an account's most recent posts, as well as up to 100 posts mentioning the account. Bot score is assigned based on an algorithm — trained through machine-learning from human and bot accounts — that makes an assessment based on user metadata, friend statistics, part-of-speech and sentiment analyses, among other criteria.
Sources: Activate analysis, Indiana University (Bloomington)

"Fake friends" appear to have real influence, and existing efforts to curb fake news on social platforms will struggle

LIKELIHOOD OF ACTION BASED ON SHARER/SOURCE OF NEWS, U.S., 2016, % NEWS READERS

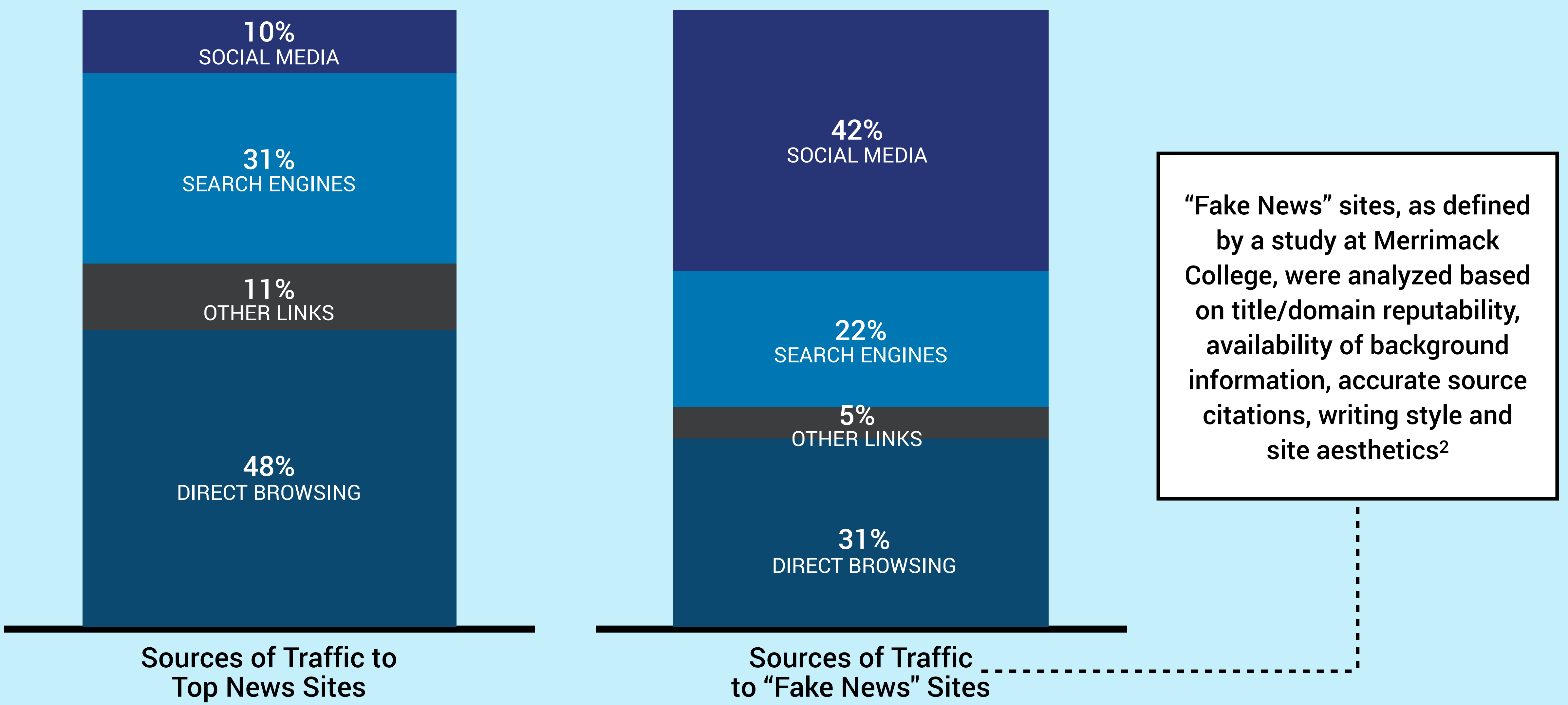


DISCOVERY DE-PRIORITIZATION	• Google has taken steps to reduce the search rankings of fake news sites • Facebook bumps fake news stories down in News Feed in order to draw away user attention
FLAGGING	• Facebook flags suspected fake news, as does Google through the "Fact Check" program • Studies suggest that flagging has minimal impact on perception of accuracy • Facebook does not share data on these posts, limiting measurement of effectiveness
REPUTABLE BRAND PROMOTION	• New Facebook features give background on reputable news sources • Facebook also features "related articles" in order to test if a given article has been corroborated by outside sources

Sources: Activate analysis, Associated Press/National Opinion Research Center (n=1,489), Facebook, Google, Yale University

The proliferation of bots and "fake friends" on social platforms – which are the primary drivers of fake news – highlights the importance of reputable news brands

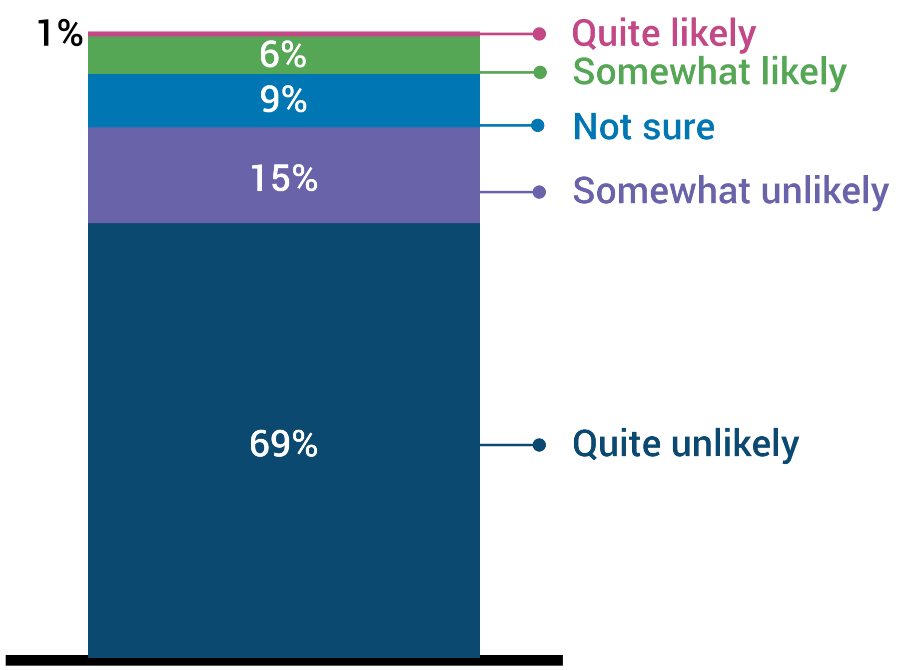
NEWS SITE TRAFFIC BY SOURCE, U.S., NOV 2016, % BY SOURCE[1]



1. Analysis draws from Alexa data on top 690 U.S. news websites, as well as 65 fake news websites selected by Journal of Economic Perspectives authors.
2. Classification of "Fake News" sites was conducted by Dr. Melissa Zimdars at Merrimack College.
Sources: Activate analysis, Alexa, Merrimack College, "Social Media and Fake News in the 2016 Election" as published in the Journal of Economic Perspectives by Hunt Alcott of New York University and Matthew Gentzkow of Stanford University

New subscriber acquisition will be difficult, but loyal subscribers may be willing to pay more for enhanced experiences

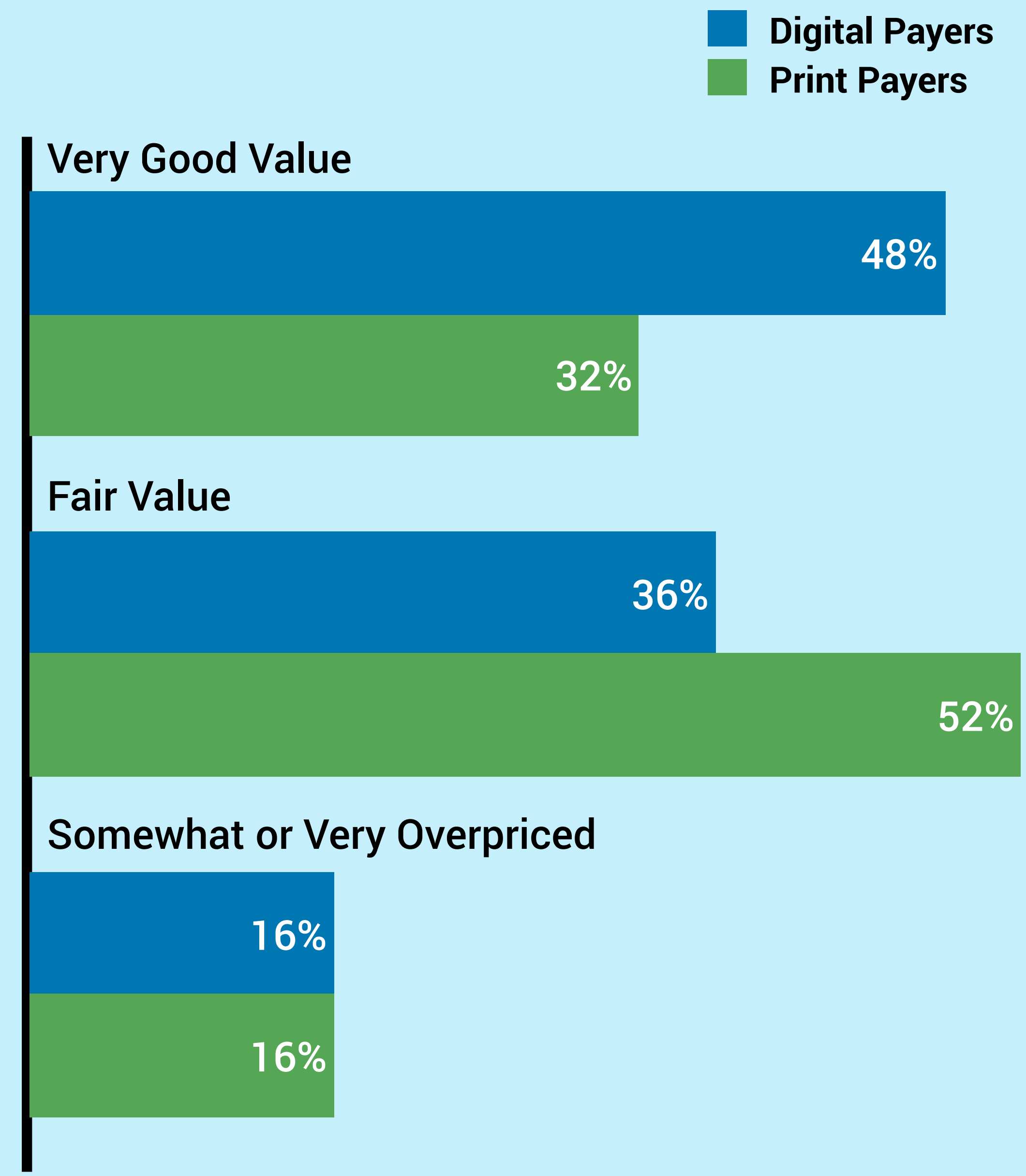
LIKELIHOOD OF PAYING FOR NEWS SUBSCRIPTION IN NEXT YEAR, U.S., 2017, % NEWS READERS



43%

of Americans subscribing to a top U.S. newspaper or local newspaper are **willing to spend more** on their current news subscription

PERCEPTION OF NEWS SUBSCRIPTION VALUE, U.S., 2016, % PAYERS



Activate research indicates that half of the news reading population could subscribe to a news publication, up from 27% today

NEWS CONSUMER SEGMENTATION LANDSCAPE

SEGMENTS	SEGMENT CHARACTERISTICS	% OF NEWS READERS IN SEGMENT
SUPER USERS	• Actively seek out news, often through direct site visits • Consider news an essential part of their media diet • Are likely paying for/donating to news sources, and are often willing to pay more for the sources that they use • More likely to be higher-income consumers	27%
POTENTIAL CONVERTS	• Actively seek out news and consider it important • May not be paying for the sources they read, although marginally more likely to be password-sharing • Value select news sources, and demonstrate a willingness to pay for digital media (e.g. video and audio) that they enjoy	23%
LONG-GAME TARGETS	• Consider news somewhat important, but more likely to find it passively on social • Significantly less likely to pay for news sources or digital media more broadly • More likely to be lower-income consumers	34%
NEWS NEVERS (LOST CAUSES)	• Less likely to consider news important, and prefer to find it passively on social • Not interested or likely to pay for news or other subscription services in the foreseeable future • Do not closely follow the news enough to justify paying for it	16%

Sources: Activate analysis, Activate 2017 Consumer Tech & Media Research Study (n=4,047)

The recent spike in news subscriptions mirrors a broader industry shift away from advertising and toward cultivating dedicated paying audiences

SOURCES OF NON-ADVERTISING REVENUE AMONG NEWS PUBLICATIONS, U.S., 2017

SUBSCRIPTION GROWTH	The New York Times	• **The New York Times saw 46% growth** over Q2 2016 in Q2 2017, adding 93,000 digital subscriptions
	The Washington Post	• **The Washington Post broke through 1 million digital subscriptions** in September 2017
TIERED MEMBERSHIP	The Atlantic	• **The Atlantic** has launched a $100/month membership program called the Masthead, which provides subscribers with exclusive content and members-only event access
	Slate	• **Slate Plus** provides exclusive content to subscribers for a **yearly fee of $35**
	Bloomberg	• **Bloomberg Businessweek** introduced a **two-tiered membership model**, starting at $50/year and rising to $87/year
ECOMMERCE	FMG	• **Fusion Media Group's** Kinja platform allows it to collect affiliate fees on products advertised through its editorial properties
CONTENT LICENSING	Vox BuzzFeed	• **Vox and BuzzFeed** have allocated significant resources to **developing long-form video content for licensing** to networks and other video distributors
CUSTOMER DATA	FINANCIAL TIMES	• **The Financial Times** began asking users for detailed information (e.g. professional industry, job, role) and charged advertisers **20-50% more** to access high-value readers
		• **Less than 20%** of newspapers (not just the Financial Times) ask for a user's gender/birth year and **less than 5%** ask for title, interests, profession, and/or education

Sources: Activate analysis, Bloomberg, Digiday, Neiman Lab, New York Times, Slate, Washington Post

Publishers looking to attract Potential Converts have a number of options, including distribution through emerging channels

"POTENTIAL CONVERT" OUTREACH OPPORTUNITIES

BUNDLED NEWS OFFERINGS

- The **Washington Post Digital Partner program**[1] grew from 96 to 308 partners from May 2014 to November 2014
- New models such as Scroll can bundle together articles from various publications for a monthly fee

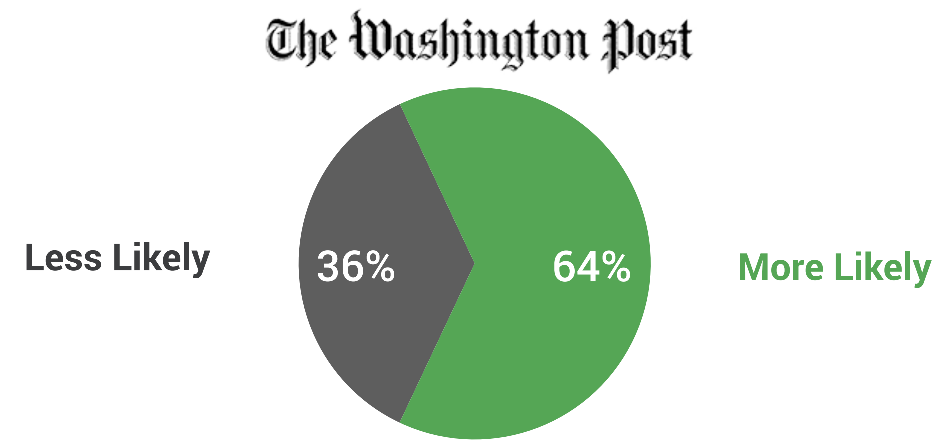
FIRST-PARTY PUBLISHING

- Some publications have invested heavily in first-party tools to **drive stronger user engagement and reach new readers**
- Opportunity to expose consumers to evergreen news content without sacrificing monetization on timely news

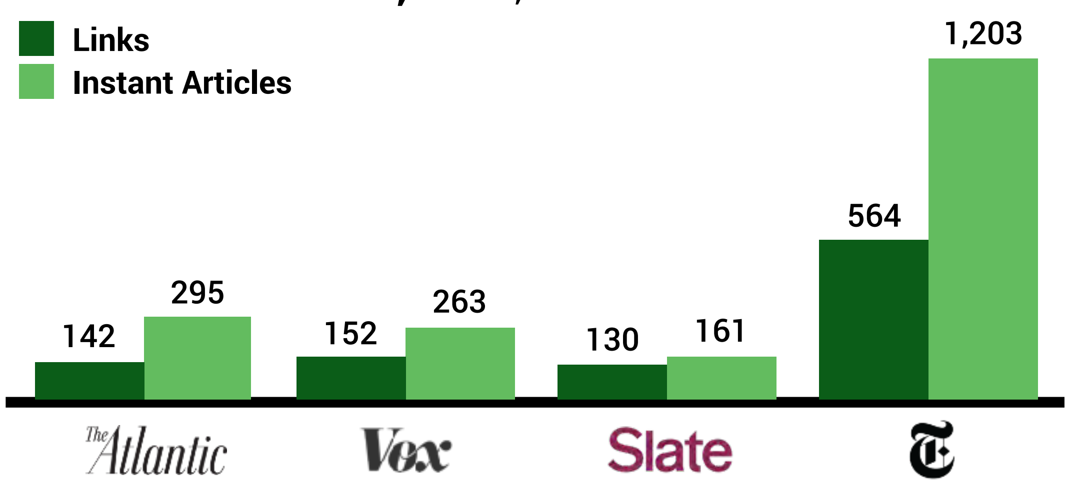
NEW MOBILE FORMATS

- **Snapchat and Instagram** have taken the lead in crafting new formats for publishers
- **Google Stamp** is likely to enter the market soon as a competitor to existing platforms
- Currently **require specialized in-house teams, favoring established brands**

LIKELIHOOD OF CONTINUED POST SUBSCRIPTION, U.S., 2016, % DIGITAL PARTNER SUBSCRIBERS



AVERAGE ENGAGEMENT (5-DAY) BY LINK TYPE, U.S., 2016, # SHARES[2]



1. The Washington Post Digital Partner program allows newspaper partner publications to offer The Washington Post's suite of digital products free as an added value for their paid subscribers.
2. The New York Times is no longer available on Facebook Instant Articles.
Sources: Activate analysis, Columbia Journalism Review, Facebook, Google, NewsWhip, Recode

For some news segments, Super Users are scattered across platforms — the best positioned franchises will have a foothold across media

MOST PREFERRED NEWS SOURCES BY NEWS TYPE AND ACTIVATE CONSUMER SEGMENT, U.S., 2017

ILLUSTRATIVE EXAMPLE

NATIONAL POLITICS

Various consumer segments seek out **national politics** through consistent methods…

SUPER USERS	POTENTIAL CONVERTS	LONG-GAME TARGETS	LOST CAUSES
1. NATIONAL TV			
2. LOCAL TV			
3. LOCAL NEWSPAPER			

BUSINESS AND FINANCE

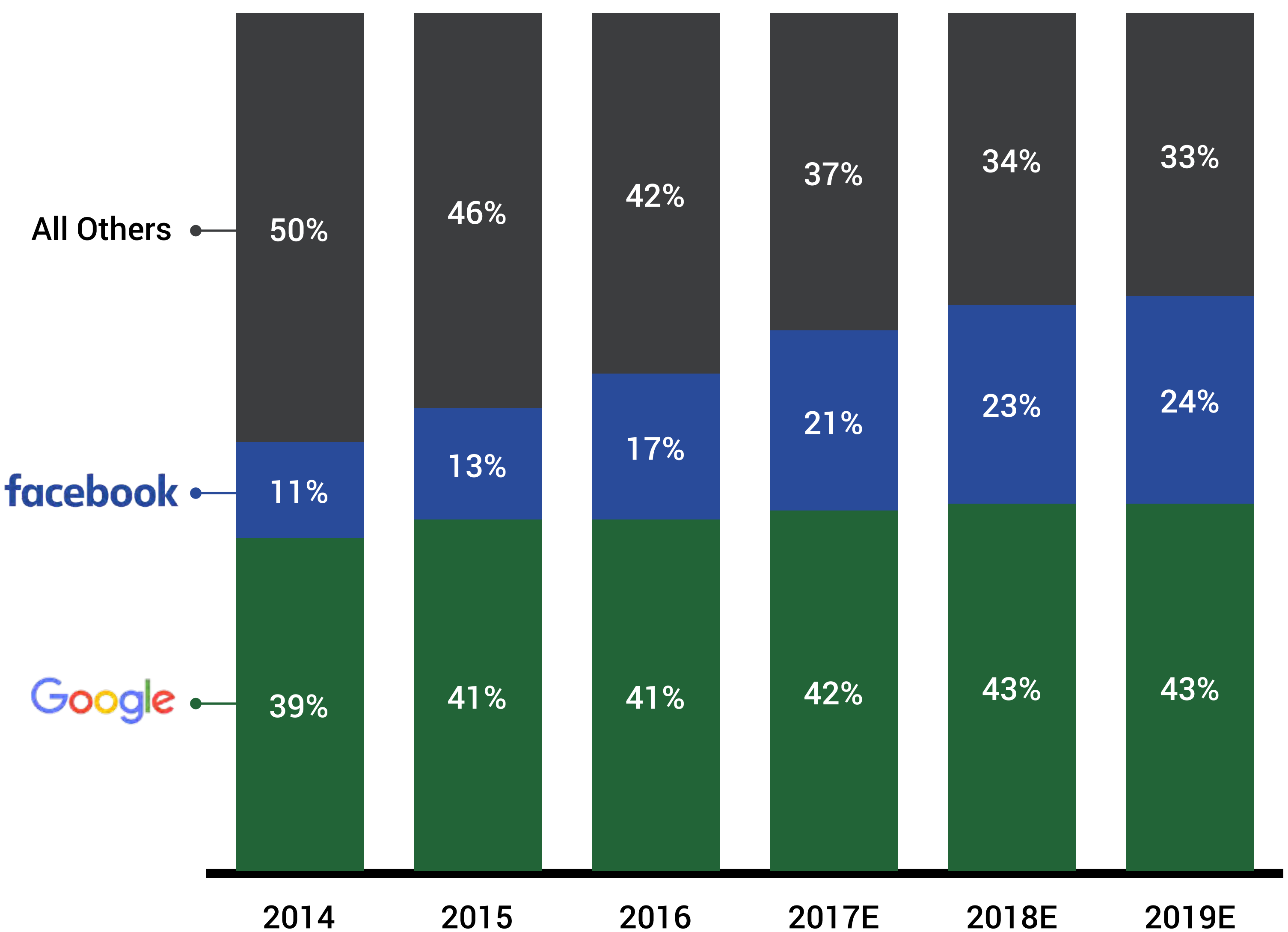
…but in **business/ finance**, sourcing among segments is quite different

SUPER USERS	POTENTIAL CONVERTS	LONG-GAME TARGETS	LOST CAUSES
1. NATIONAL TV	1. NATIONAL TV	1. LOCAL TV	1. LOCAL TV
2. LOCAL NEWSPAPER	2. LOCAL TV	2. NATIONAL TV	2. RADIO NEWS
3. LOCAL TV	3. NEWS PORTALS	3. NEWS PORTALS	3. NEWS PORTALS

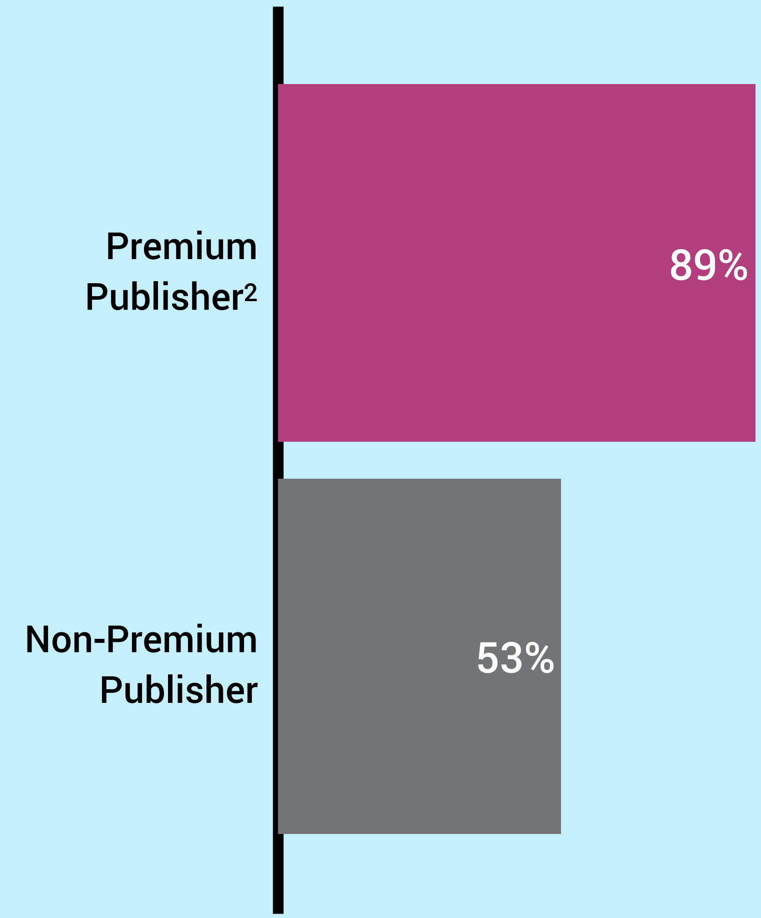
Sources: Activate analysis, Activate 2017 Consumer Tech & Media Research Study (n=4,047)

Well-known news brands will not only be preferred — they will be the only news outlets capable of building an advertising business as Facebook and Google tighten their hold

DIGITAL ADVERTISING SHARE BY COMPANY, U.S., 2014-2019E, % SPEND



AVERAGE BRAND LIFT BY PUBLISHER TYPE, U.S., 2016, BRAND LIFT GROWTH[1]

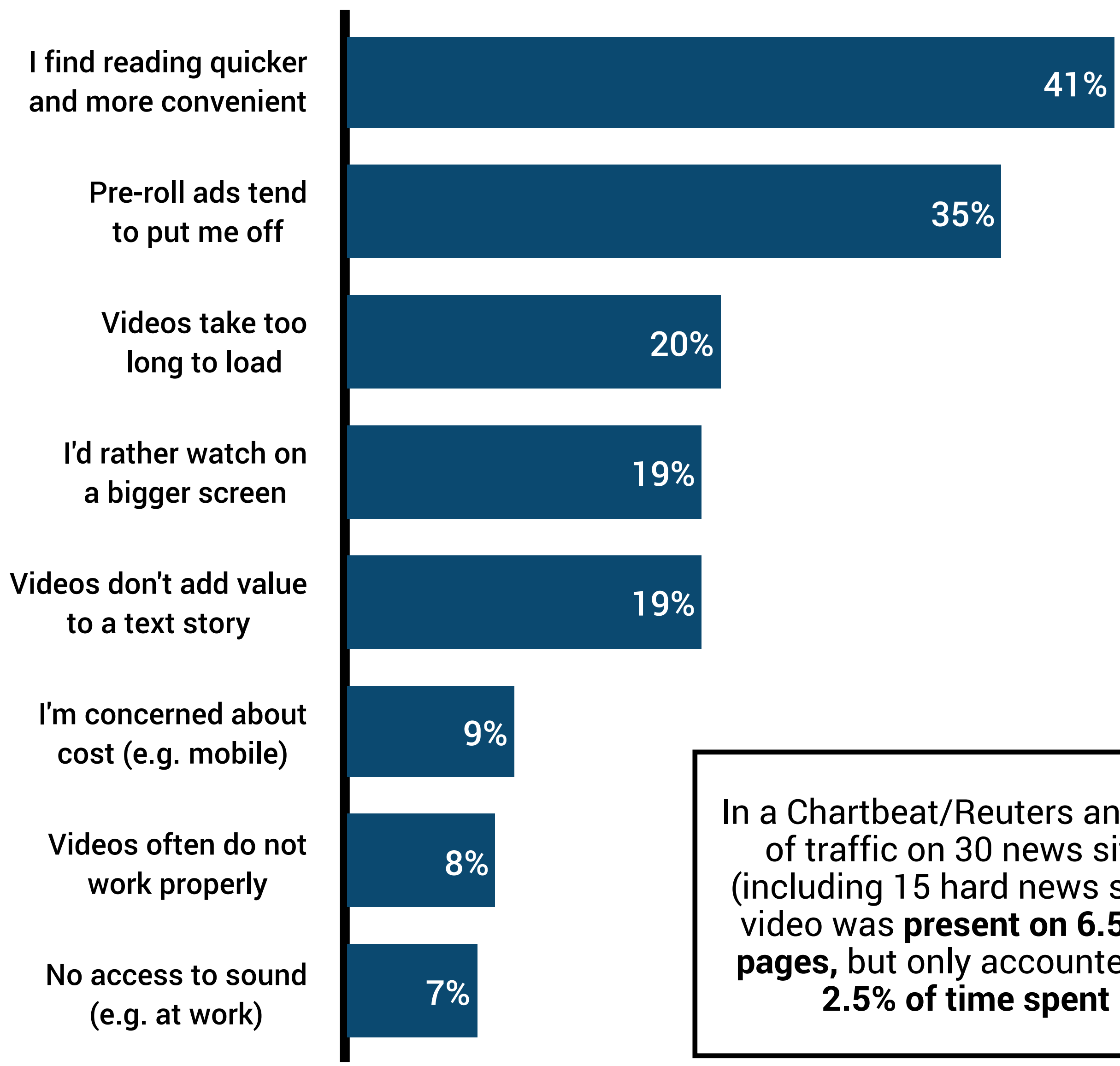


1. Brand lift estimates are based on weighted impressions, and are drawn from surveys with at least 400 respondents, at least 75 respondents in a DCN-exposed group, and that ran on both DCN and non-DCN sites. Brand lift growth defined as an increase in user interaction with brand (e.g. through impressions or conversion) as a result of a campaign.
2. Digital Content Next (DCN) is a consortium of digital publishers that are considered "premium publishers", and is therefore a proxy for established news brands.

Sources: Activate analysis, comScore, Digital Content Next, eMarketer, IAB

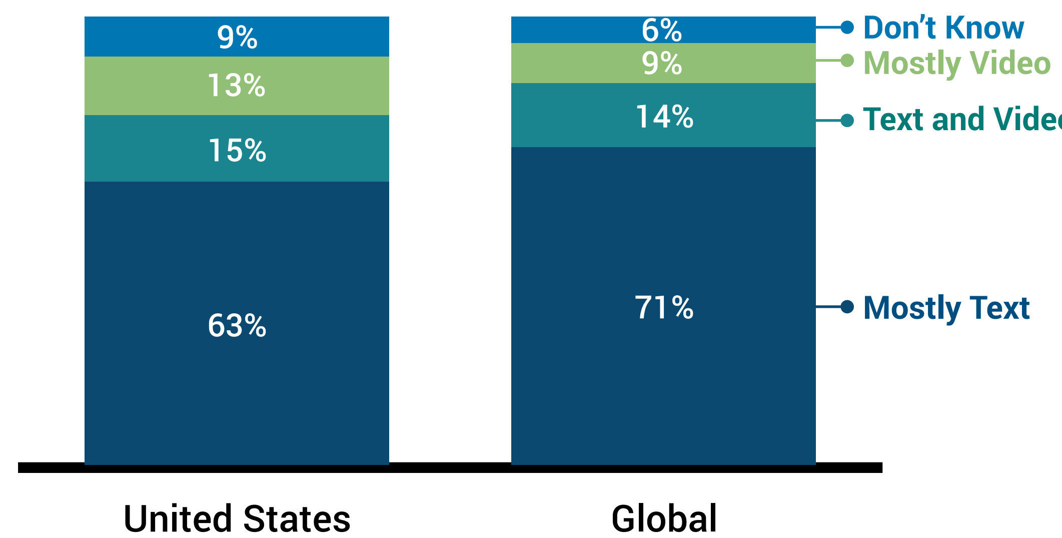
Video provides news publishers with a valuable near-term advertising opportunity, but the "pivot to video" may clash with consumer preference for text

REASONS FOR NOT WATCHING ONLINE NEWS VIDEO, U.S., 2016, % NEWS READERS

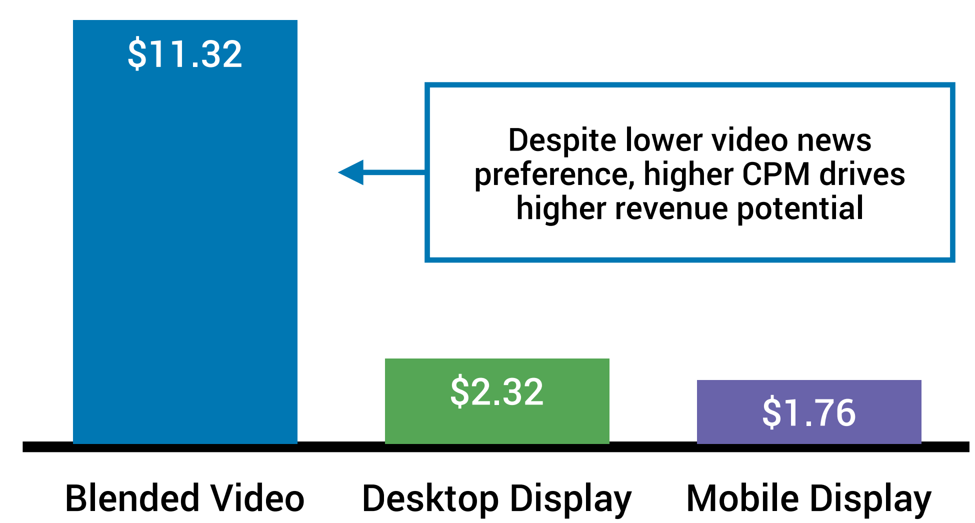


In a Chartbeat/Reuters analysis of traffic on 30 news sites (including 15 hard news sites), video was **present on 6.5% of pages,** but only accounted for **2.5% of time spent**

PREFERENCE FOR TEXT AND/OR VIDEO IN NEWS, U.S. AND GLOBAL, 2016, % NEWS READERS



AVERAGE CPM FOR DIGITAL VIDEO AND DISPLAY ADS[1], U.S., Q4 2016, USD

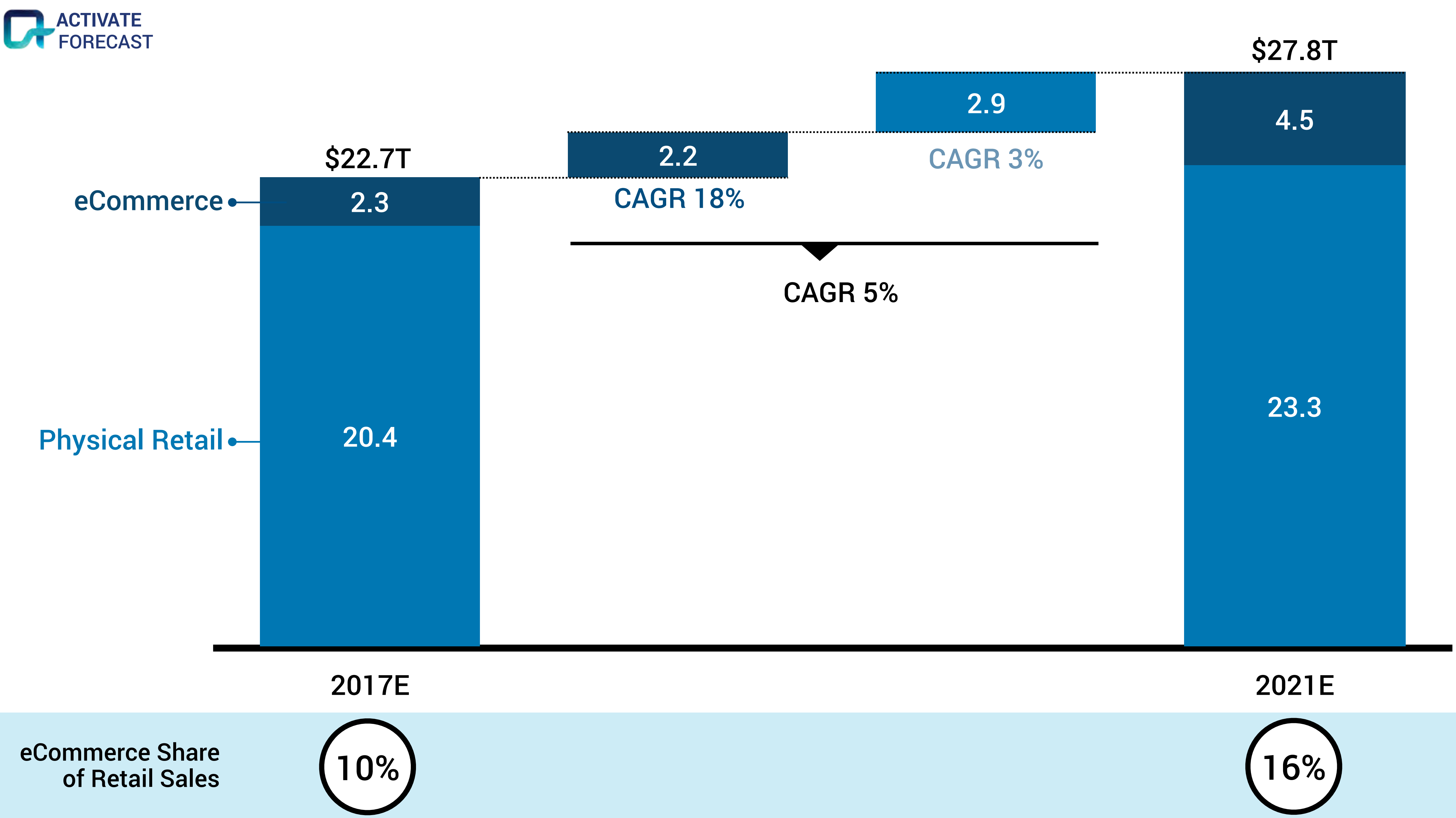


1. Video price is a blended measurement of in-stream and out-stream ad types, and assumes purchase from a self-service programmatic platform. Display prices are also blended for ad types/sizes, and assume same purchase method.
Sources: Activate analysis, Chartbeat, eMarketer, IAB, Reuters

The Most Important Insights for Tech and Media in 2018

Over the next four years, the global retail sector will add $5 trillion; physical retail will take more growth dollars, while eCommerce will grow faster

RETAIL SALES PROJECTIONS[1], GLOBAL, 2017E-2021E, TRILLIONS USD

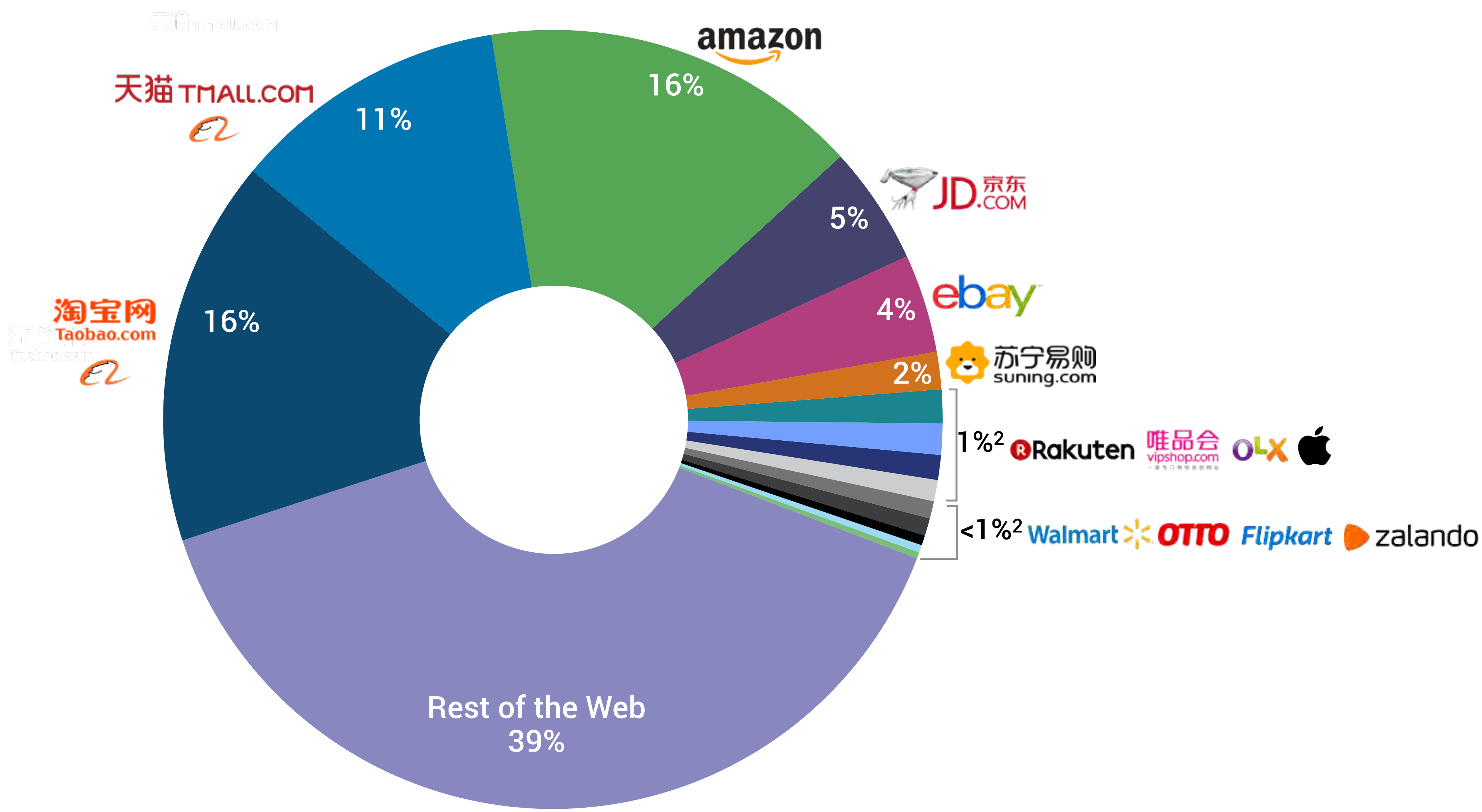


1. Excluding travel and event tickets.
Sources: Activate analysis, eCommerce Foundation, eMarketer, GfK, Invespcro, U.S. Census Bureau

Although the top 15 eCommerce players generate over 60% of gross merchandise volume, the business is likely to be very competitive

GMV (GROSS MERCHANDISE VOLUME)[1], GLOBAL, 2016, % GMV

2016 GLOBAL TRANSACTION VOLUME = $1.9T



1. Excluding travel and tickets.
2. Each 1% or <1% respectively.
Sources: Activate analysis, Company financials, eCommerce Foundation, eMarketer, Fortune, GeekWire, Nasdaq, National Retail Federation, OfferUp, OLX, TechCrunch

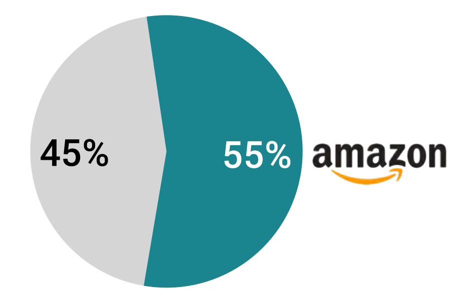
These 15 players are largely marketplace platforms — where tens of millions of sellers will continue to fuel growth

BREAKDOWN OF TOP 15 ECOMMERCE COMPANY[1] GMV BY BUSINESS MODEL, GLOBAL, 2016, % GMV

GLOBAL TOP 15 PLAYER GMV = $1.2T

Largest eCommerce platforms capture consumer attention and embed themselves in shopping habits

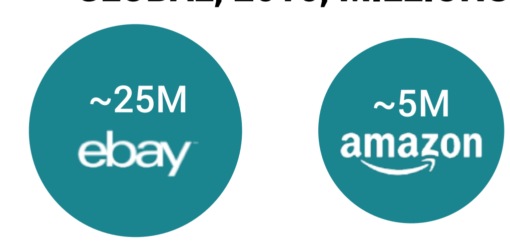
SHARE OF ONLINE PRODUCT SEARCHES, U.S., SEP 2016, % SEARCHES



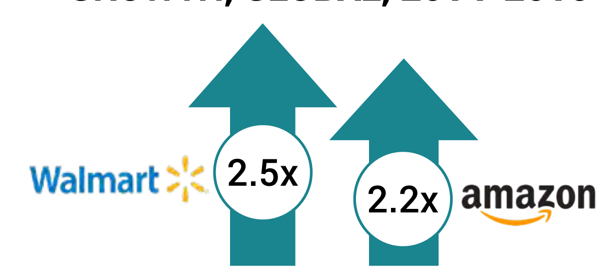
Marketplaces enable tens of millions of sellers…

…who allow platforms to grow by focusing on transactions and fulfillment without inventory risk

EST. NUMBER OF SELLERS, GLOBAL, 2016, MILLIONS



EST. MARKETPLACE GMV GROWTH, GLOBAL, 2014-2016



1. Excluding travel and tickets.
Sources: Activate analysis, BloomReach, Company financials, eMarketer, Fortune, GeekWire, Nasdaq, National Retail Federation, OfferUp, OLX, TechCrunch

Despite the dominance of the largest eCommerce players, there are extensive capabilities to enable other retailers to sell online

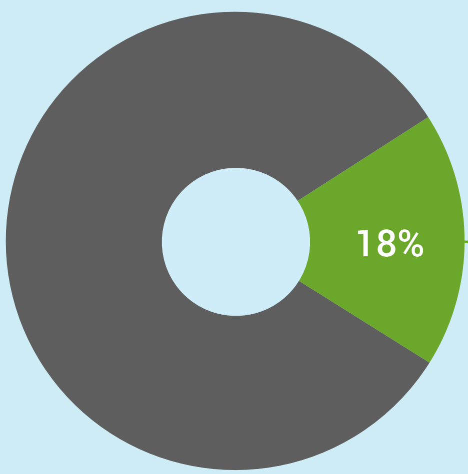
ECOMMERCE CAPABILITY STACK

TRANSACTION	DELIVERY PLAYERS	UPS	FedEx	United States Postal Service	DHL	
TRANSACTION	FULFILLMENT ENABLERS	ShipStation	ShipBob	RedStag Fulfillment	shippo	fulfillment by amazon
TRANSACTION	PAYMENT PROCESSORS	Square	stripe	PayPal	VISA Checkout	adyen
DISCOVERY	SOCIAL INSPIRATORS	Pinterest	Instagram	facebook	Payvment	shopalize
DISCOVERY	AGGREGATORS	Google Express	instacart	Dote	Cratejoy	Peapod
DISCOVERY	SEARCH OPTIMIZERS	MOZ	BuzzStream	SEOlytics	JumpFly	Boostability
INFRASTRUCTURE	STORE CREATORS	shopify	SQUARESPACE	BIGCOMMERCE	WiX.com	weebly
INFRASTRUCTURE	PLATFORM PROVIDERS	Magento	WooCommerce	opencart	cs.cart	PrestaShop

Sources: Activate analysis, Big Commerce, Capterra, CB Insights, Crunchbase, Forbes, Fortune, Luma Partners, Marketing Mag, New York Times, Wall Street Journal, Website Builder Expert

For many categories, consumers will increasingly gravitate towards private labels, as platforms and retailers will favor discovery of their own products

PRIVATE LABEL SHARE OF SALES FOR SUPERMARKET, MASS AND DRUG CHANNELS, U.S., 2016, % SALES

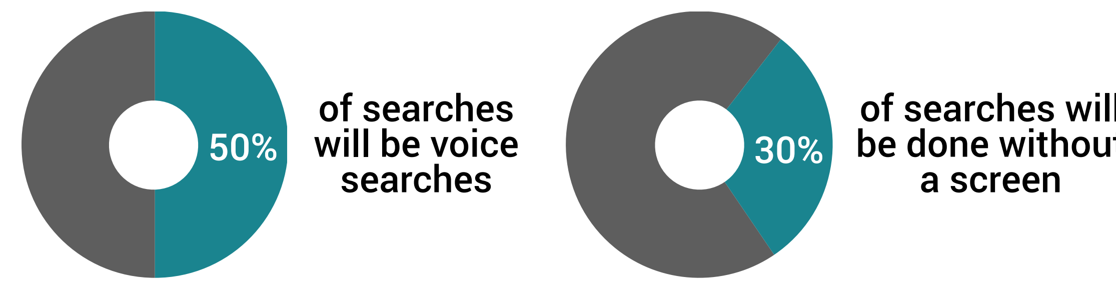


Private label sales: $118B

EXAMPLES OF PRIVATE LABEL BRANDS WITH HIGH VALUE AND QUALITY PERCEPTION

- wholesome (NUTRITION • HEALTHY LIFESTYLE)
- BRANDLESS™
- KIRKLAND Signature
- DOLLAR SHAVE CLUB
- amazonbasics
- 365 EVERYDAY VALUE

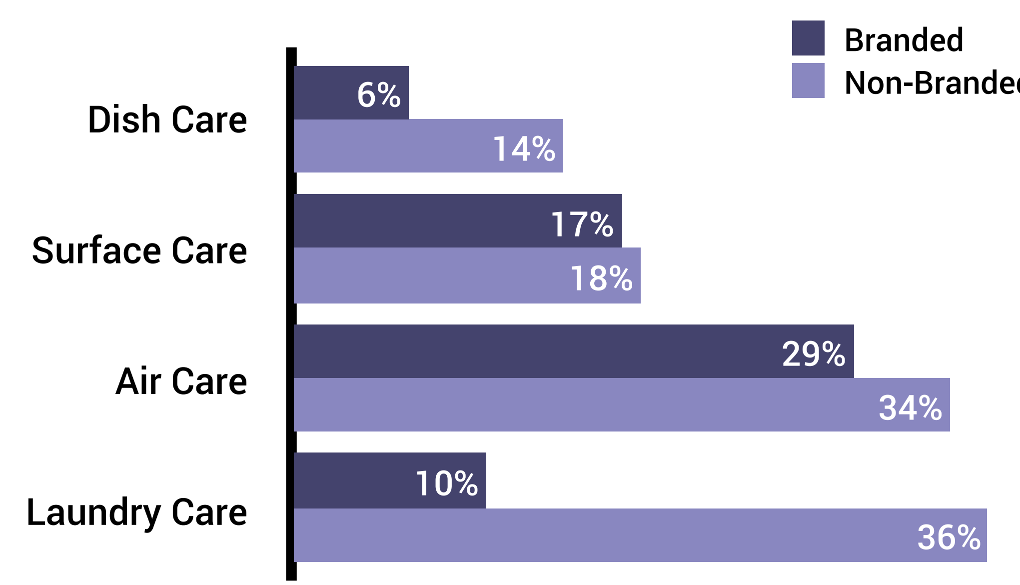
SHIFTS IN SEARCH BEHAVIOR, 2020E



Generic products are likely to benefit from new discovery methods, such as smart speakers

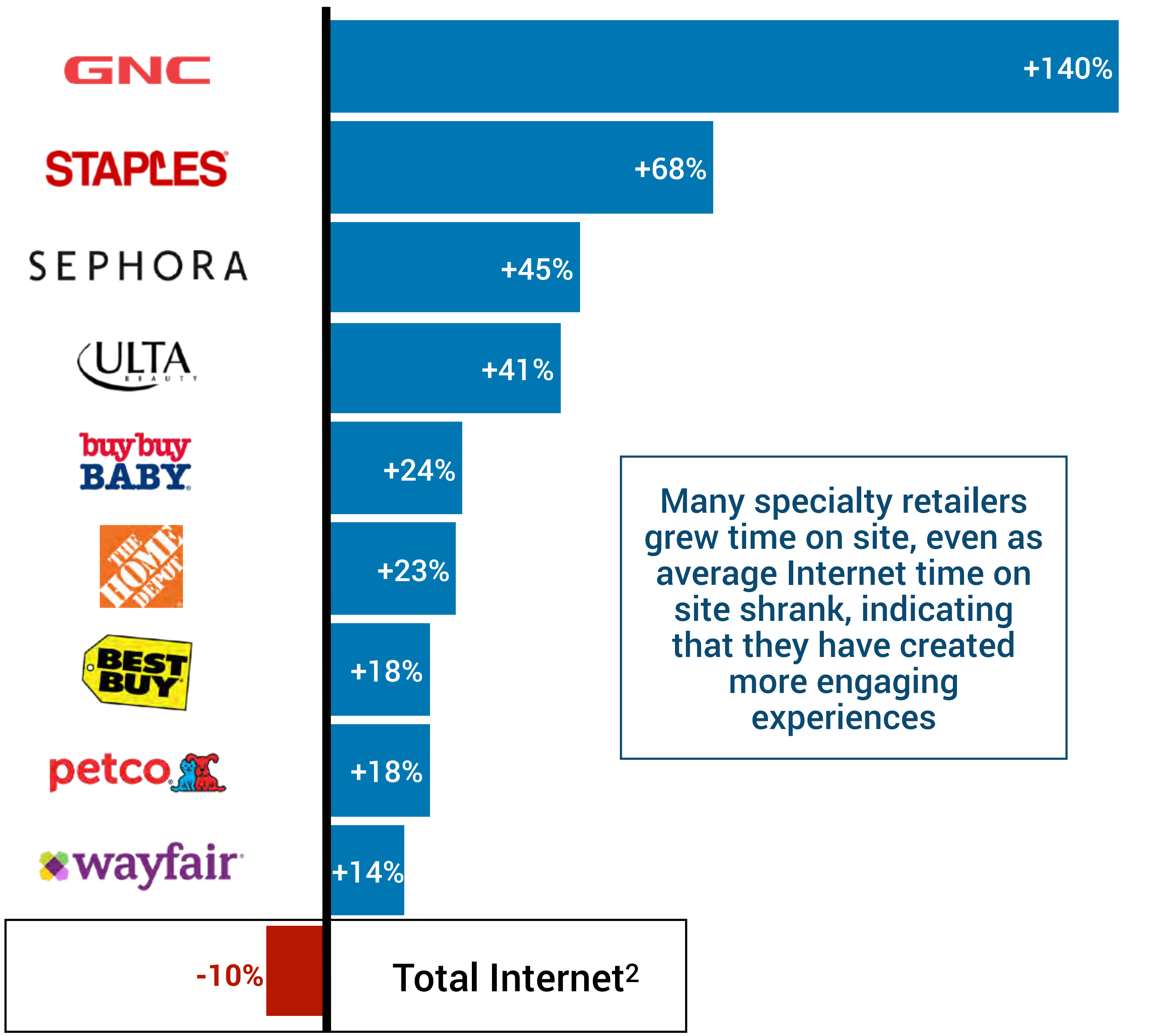
Platform owners will favor their own private labels first in query results

BRANDED VS. NON-BRANDED GROWTH IN SEARCH VOLUME, U.S., APR 2016 VS. MAR 2017



Specialty retailers and brands will continue to drive engagement and revenue through compelling and curated experiences

GROWTH IN TIME SPENT PER SITE VISIT[1], U.S., AUG 2015-2017, %



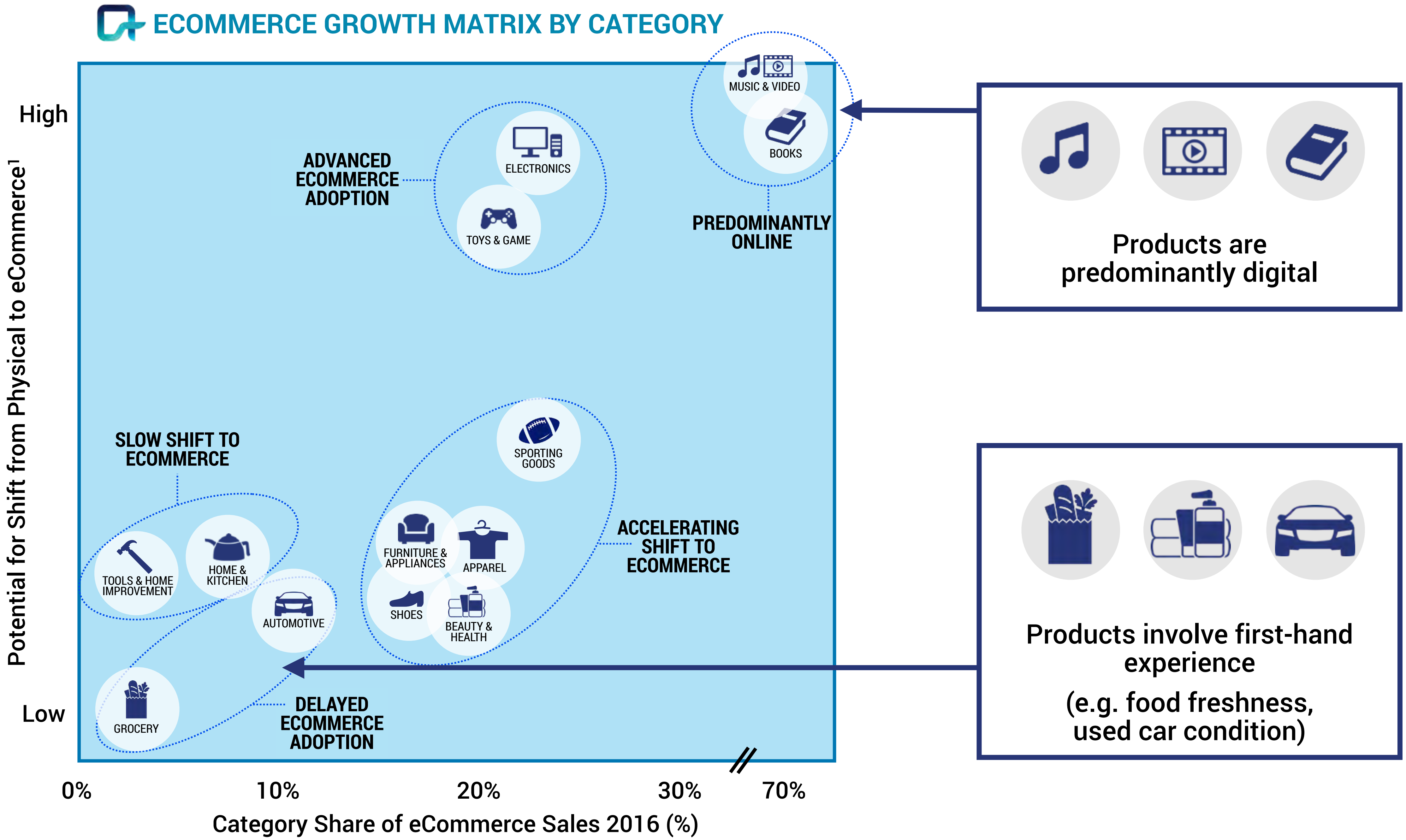
Many specialty retailers grew time on site, even as average Internet time on site shrank, indicating that they have created more engaging experiences

KEY STRENGTHS OF SPECIALTY RETAIL

1. Time spent on website per visit across all platforms.
2. Average time spent per visit across all Internet as defined by comScore.
Sources: Activate analysis, comScore

Category-specific consumer preferences will drive different eCommerce adoption curves

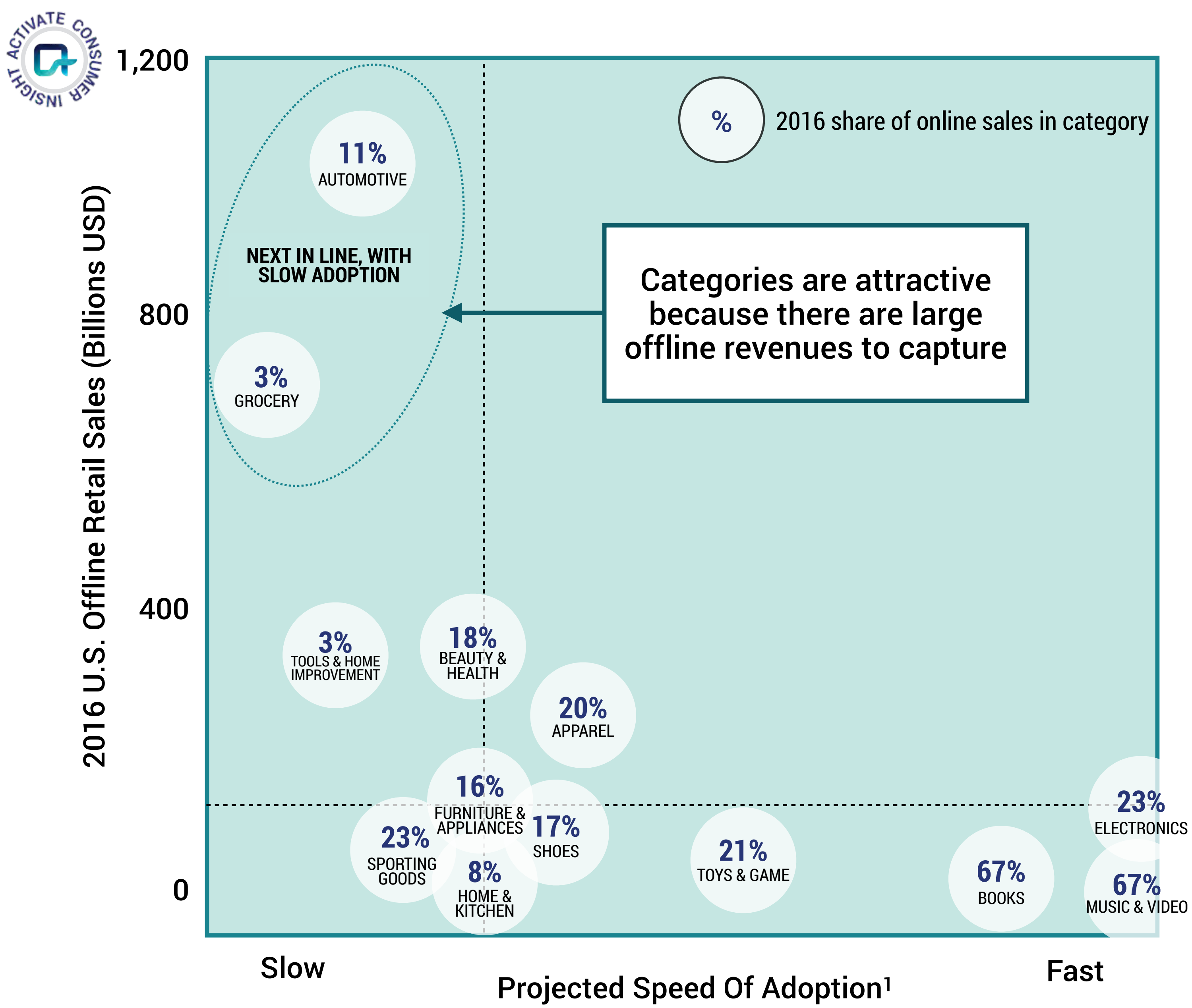
ECOMMERCE GROWTH POTENTIAL BY CATEGORY, U.S.



1. Index based on measured consumer preferences from Activate 2017 Consumer Tech & Media Research Study.
Sources: Activate analysis, Activate 2017 Consumer Tech & Media Research Study (n=4,047), Cowen and Company, eMarketer, Kantar Retail, Nielsen, U.S. Census Bureau

Grocery will be the next eCommerce battleground, however, adoption will be slow

ECOMMERCE ADOPTION FORECAST BY CATEGORY, U.S.



WHAT COULD ACCELERATE THE PENETRATION OF ECOMMERCE IN GROCERY?

CONSUMER TRUST
in fresh food delivery

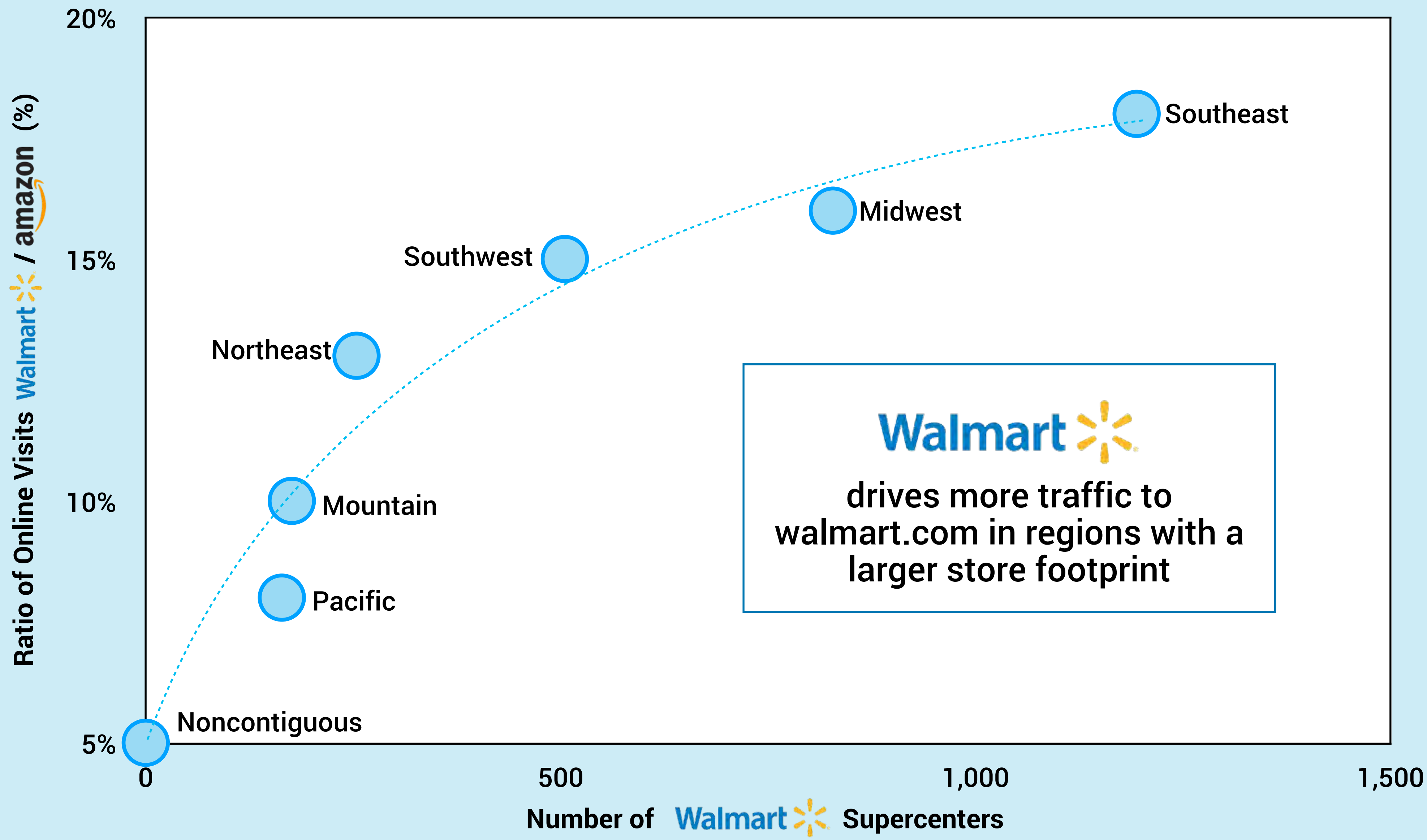
DELIVERY EXPERIENCE
that is fast and satisfactory, particularly for fresh food offerings

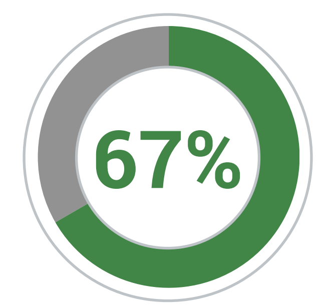
PRICING
that is consistent and competitive

1. Index based on measured consumer preferences.
Sources: Activate analysis, Activate 2017 Consumer Tech & Media Research Study (n=4,047), DrugStore News, eMarketer, Euromonitor, IBIS World, International Publisher's Association, IRI, One Click Retail, PricewaterhouseCoopers, St. Louis FRED, U.S. Census Bureau, Venture Beat, Wazir

Walmart and other physical retailers are likely to take advantage of their physical presence, ultimately driving higher revenue per shopper

IMPACT OF WALMART'S PHYSICAL FOOTPRINT ON ONLINE ENGAGEMENT BY REGION, U.S., 2016, # WALMART STORES VS. RATIO OF ONLINE VISITS (WALMART/AMAZON)





OF CONSUMERS WHO PREFER TO BUY ONLINE RELY ON A PHYSICAL STORE whether before or after their purchase

Physical retail will strengthen its hold with the integration of technology into in-store experiences

DYNAMIC PRICING

- Ensures consistent competitive prices with online retailers
- Minimizes showrooming

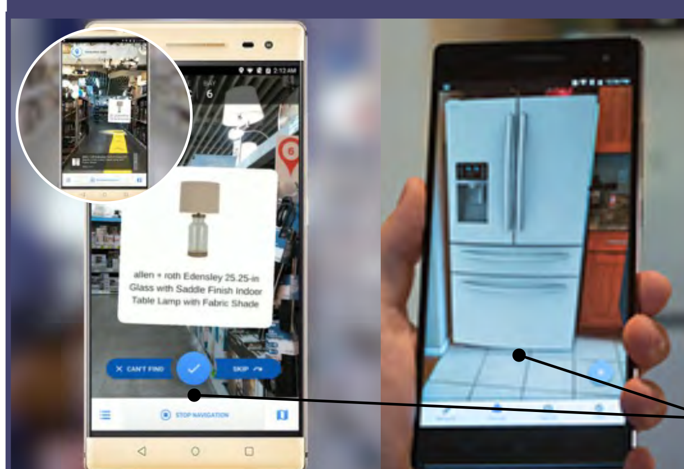
Digital price display

CUSTOMIZED SERVICE AND EXPERIENCE

- Offers services such as product information, recommendations, and seamless checkout

Smart mirror (e.g. Oak Labs)

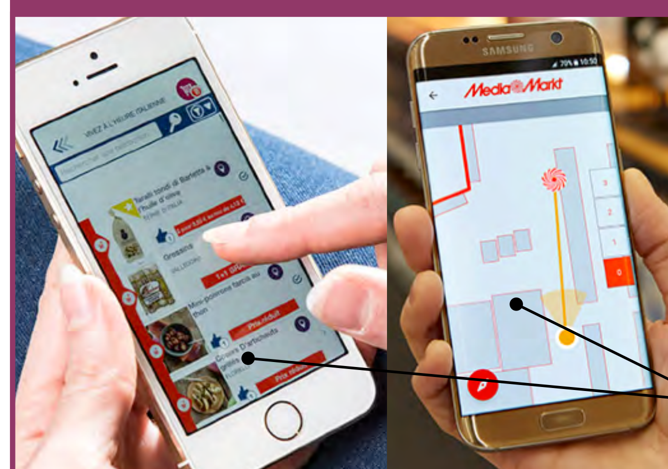
PRODUCT INFORMATION AND DISCOVERY



- Assists shopper with product discovery both in-store and online (e.g. at home)

Augmented Reality mobile technology (e.g. Lowe's)

PERSONALIZED IN-STORE TARGETING



- Feeds recommendations and promotions to consumers based on shopping history across channels

In-store apps powered by visible light communication (e.g. MediaMarkt, Edeka, Carrefour)

Sources: Activate analysis, Amazon, Aptaris, Carrefour, eMarketer, Forbes, Lowe's, MediaMarkt, New York Times, Oak Labs, Philipps, Retention Science

Asia is leading the way for the adoption of digital commerce innovations, including the integration of physical and digital

ADVANCED LOGISTICS AND INVESTMENT IN TECHNOLOGY

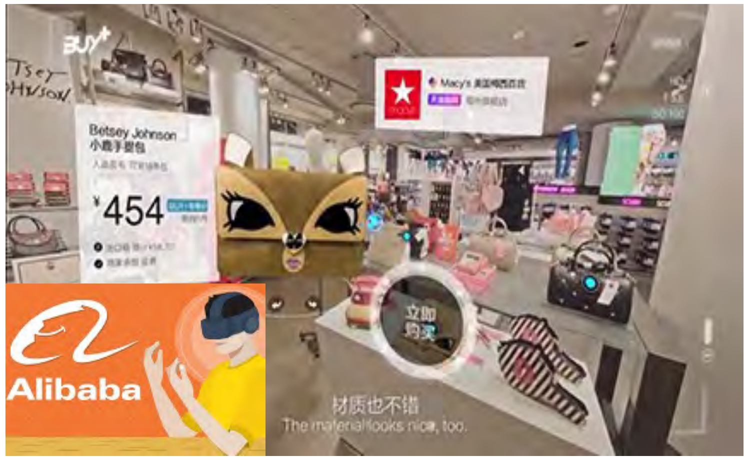
ROBOT DELIVERY

AERIAL DRONE DELIVERY

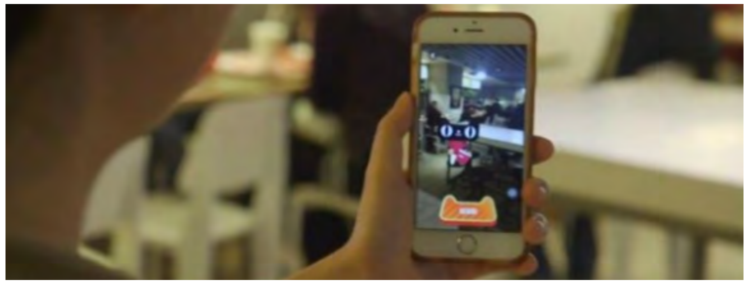
New time- and cost-efficient delivery methods improve service area (e.g. rural area access) and quality of delivered goods (e.g. fresh goods)

ENGAGEMENT ELEMENTS

VIRTUAL REALITY STORE: ALIBABA BUY+



AUGMENTED REALITY SHOPPING GAME: TMALL



Brings new experiences such as 3D and game-based brick and mortar shopping to customers, increasing visits

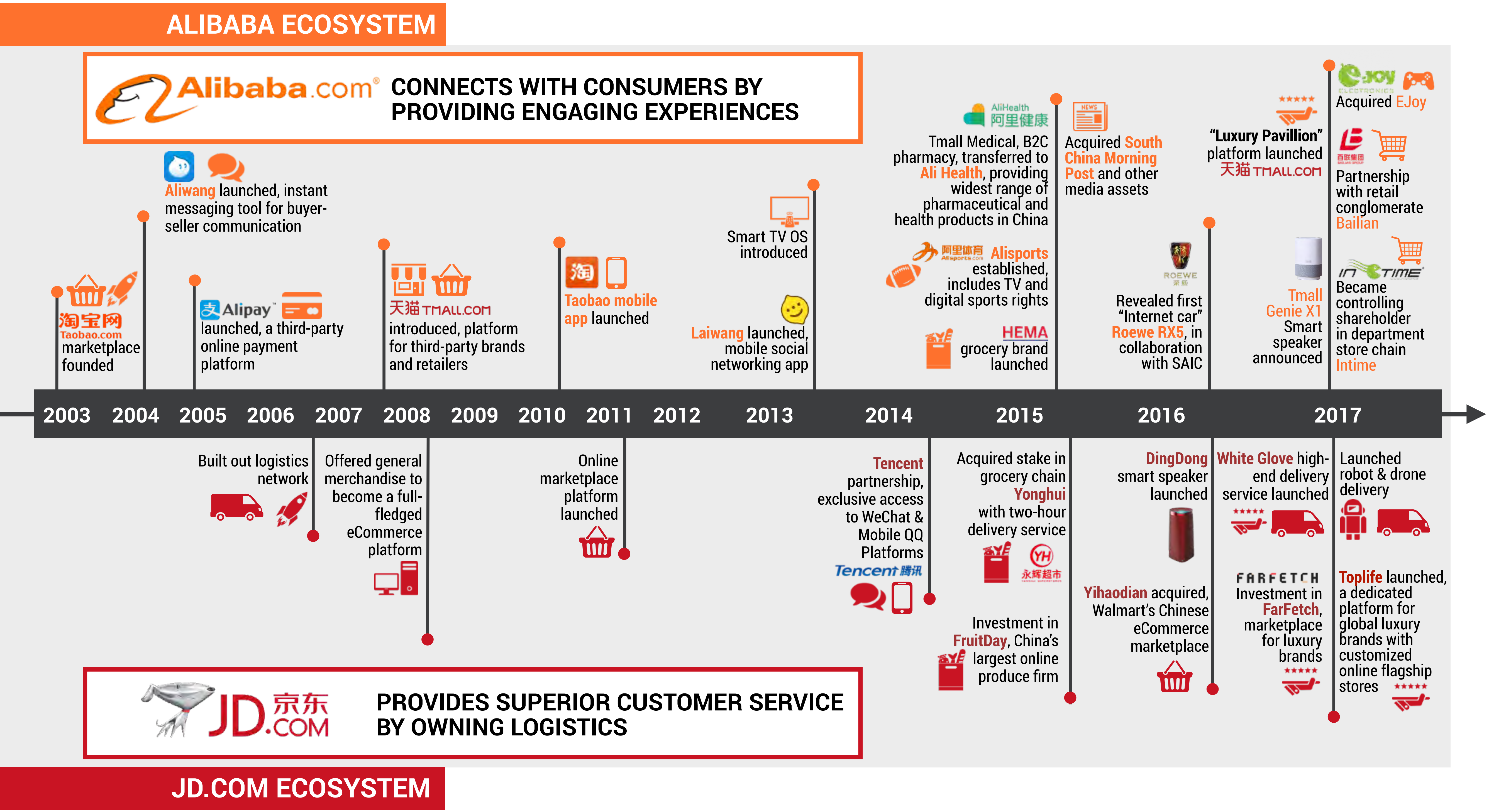
PHYSICAL AND DIGITAL INTEGRATION

SMART SUPERMARKET: ALIBABA'S HEMA SUPERMARKET

CASHIER LESS MOBILE STORE: MOBY MART

Enables cashless and automated checkout and delivery, while maintaining essential aspects of the in-store experience

In general, Asia is providing a potential roadmap for the future of eCommerce, focused on shopper engagement and seamless service

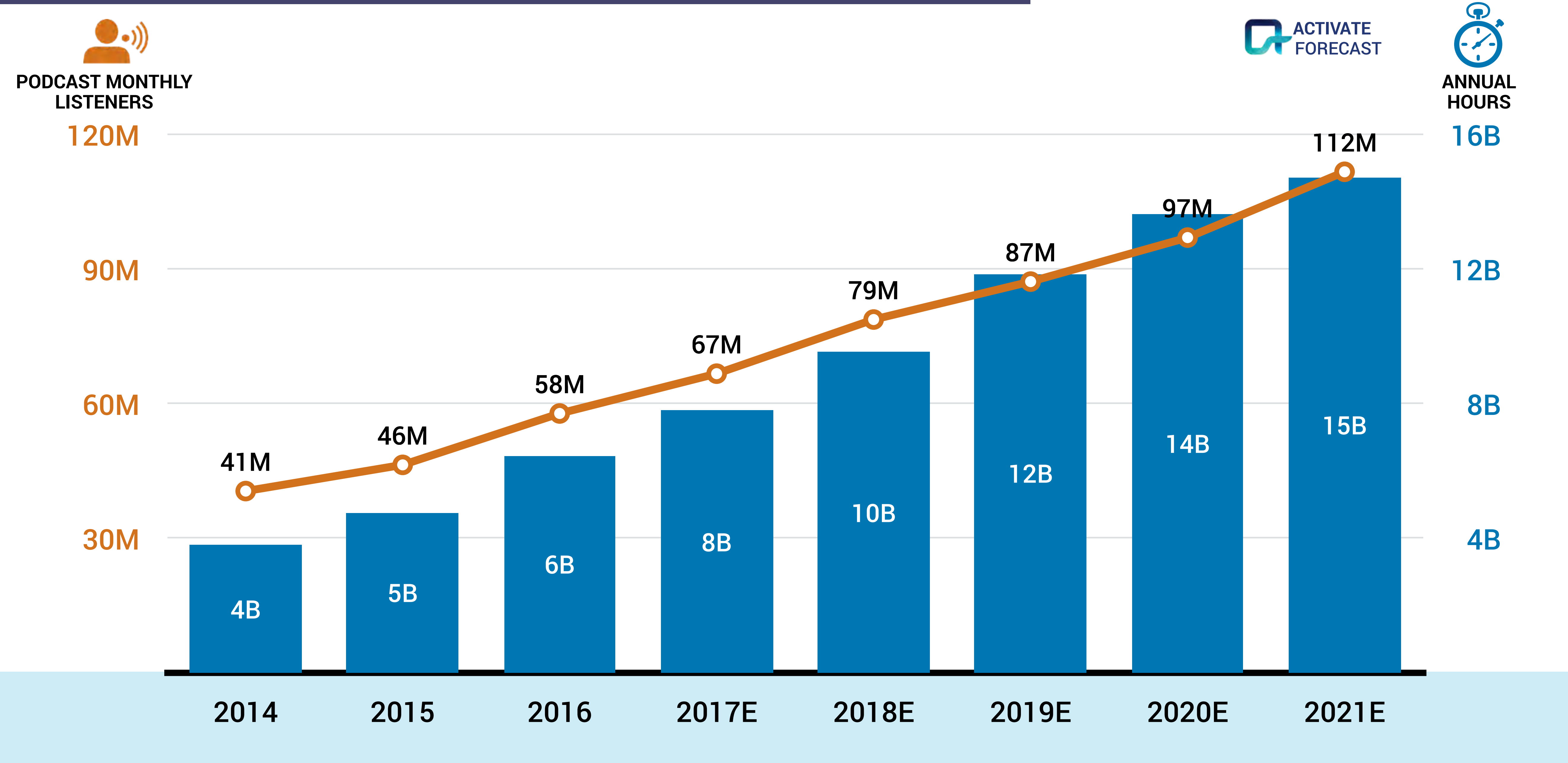


Sources: Activate analysis, AdWeek, Alibaba, JD.com, Line, Nasdaq GlobeNewswire, Quartz, South China Morning Post, TechCrunch, Tencent, Yahoo Finance

The Most Important Insights for Tech and Media in 2018

Podcast listening will dramatically increase — powered by more content, more listeners, and increased daily usage

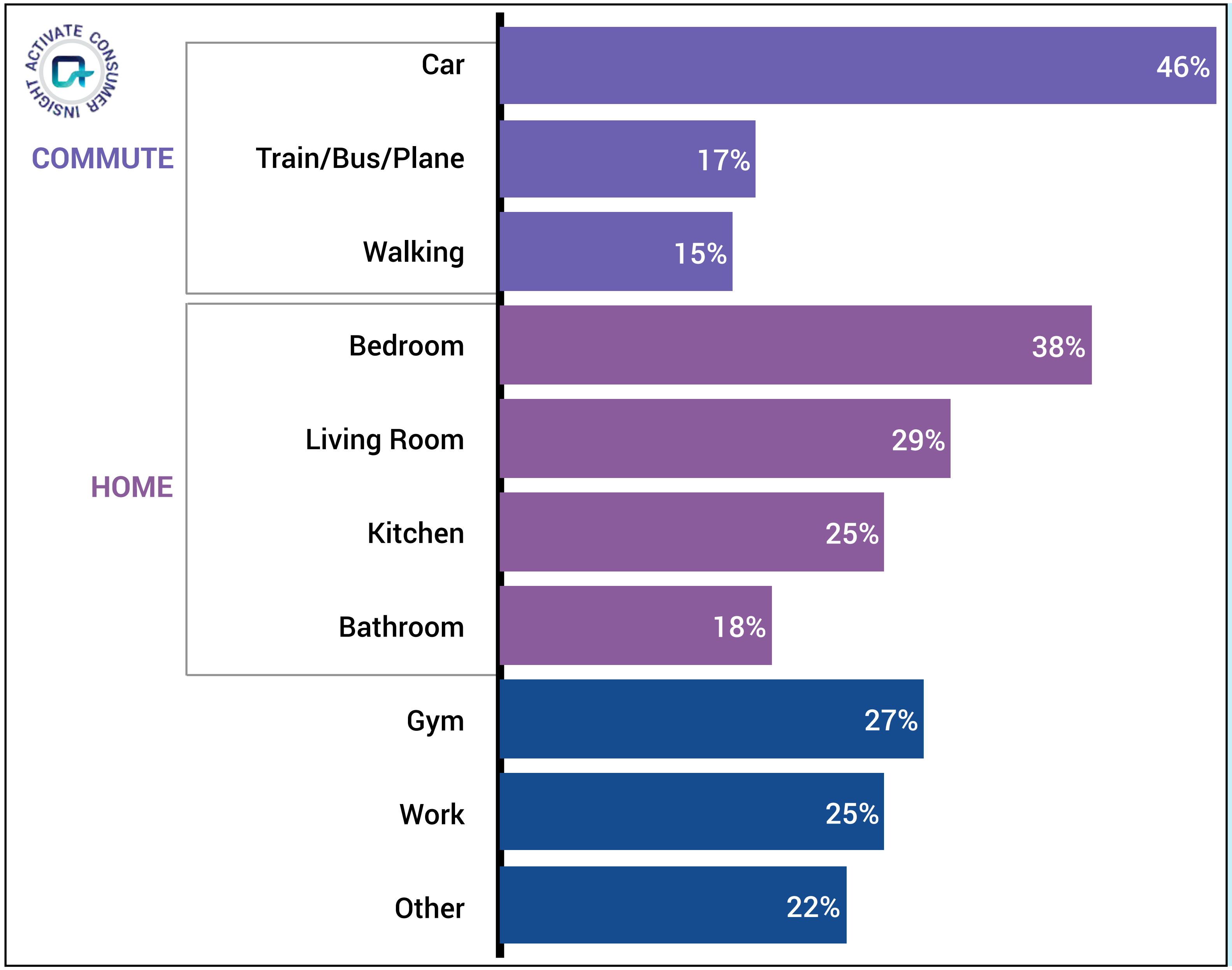
MONTHLY PODCAST LISTENERS AND ANNUAL LISTENING TIME, U.S., 2014-2021E



Sources: Activate analysis, Bridge Ratings, Edison Research

Smart speakers and connected cars will also spur increased listening and adoption

LOCATION OF PODCAST LISTENING, U.S., 2017, % LISTENERS

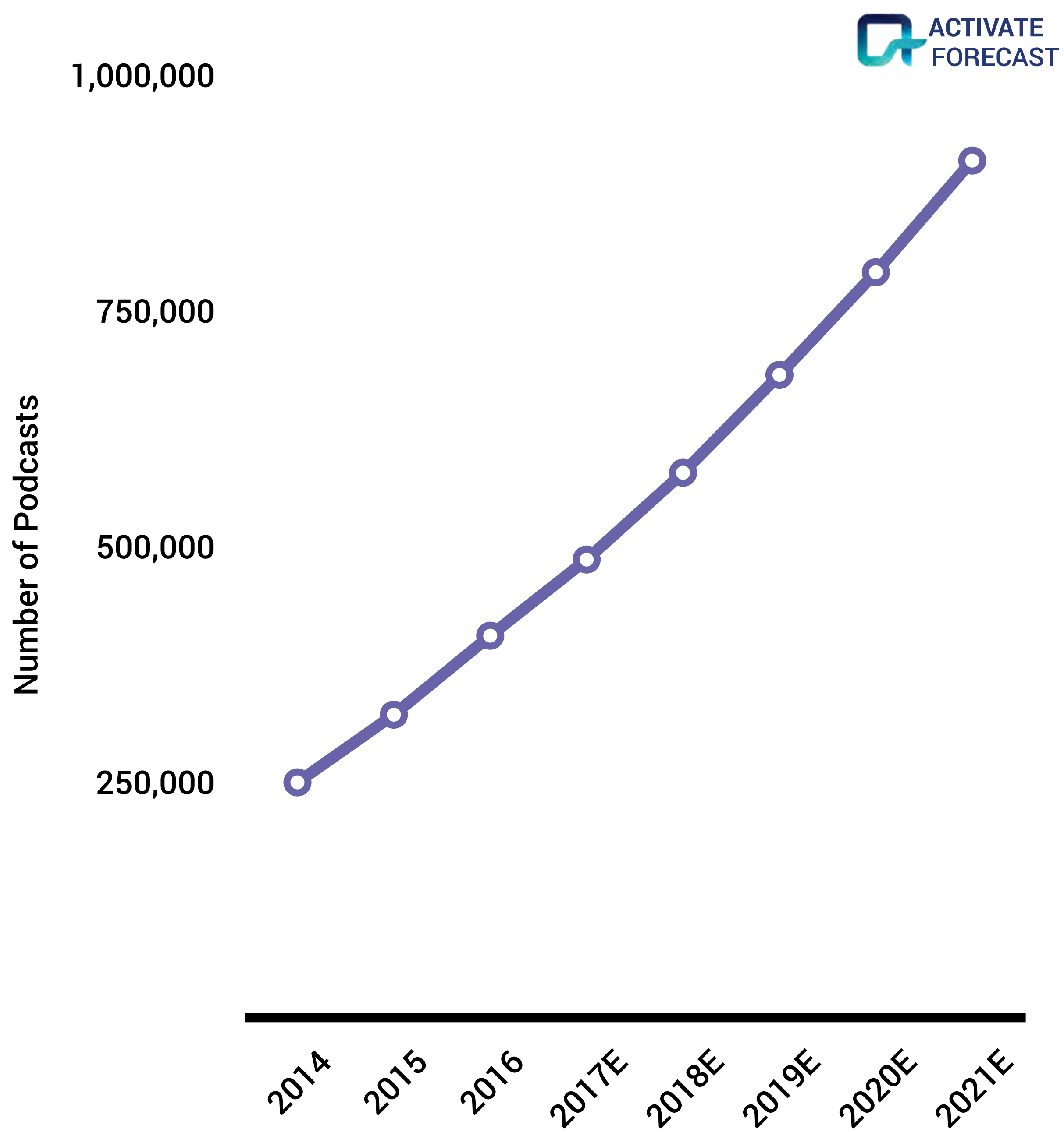


- Smart speaker owners are ~1.6x more likely to listen to podcasts than non-smart speaker owners
- Smart speaker short-form audio content could increase listening through curated news summaries (e.g. Alexa Flash Briefings, Google Assistant, 60dB[1] Quick Hits)

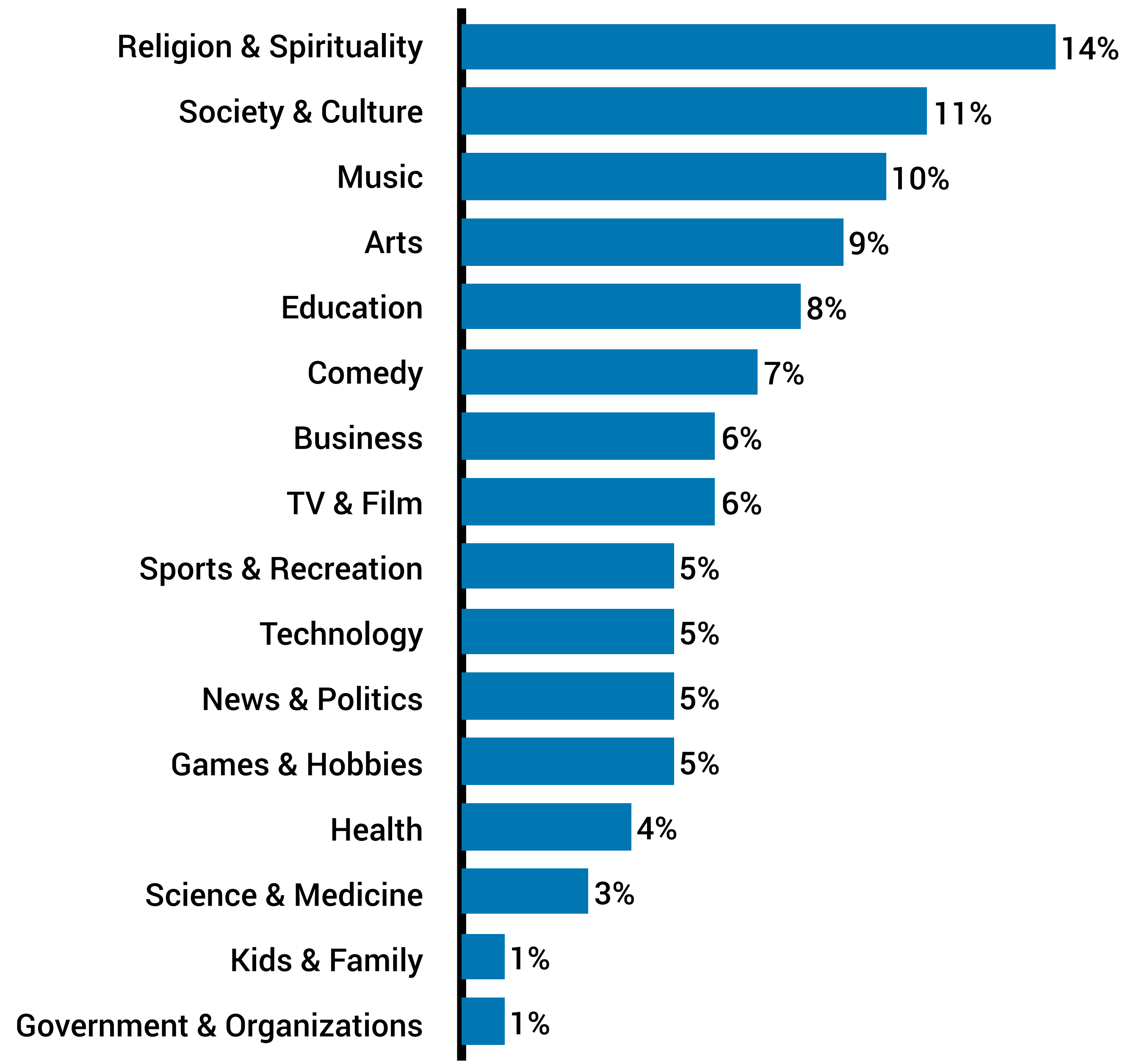
1. 60dB is a recent Google acqui-hire.
Sources: Activate analysis, Activate 2017 Consumer Tech & Media Research Study (n=419), NPR/Edison Research

The actual number of podcasts will increase as well; consumers will listen to a broad range of podcast genres

NUMBER OF PODCASTS, U.S., 2014-2021E

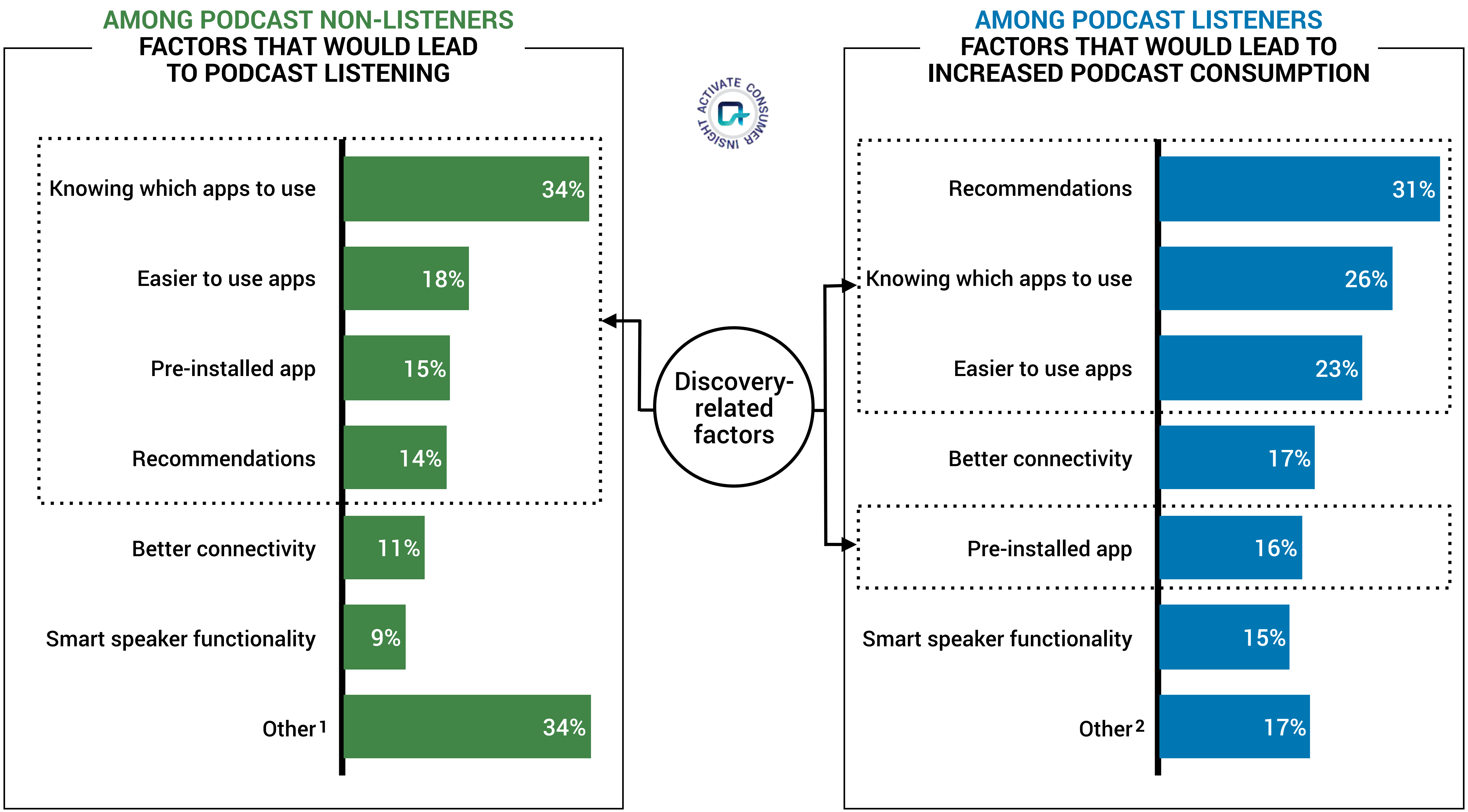


PODCAST GENRES[1], U.S., 2017, % TOTAL PODCASTS



1. Podcast genre distribution based on iTunes library.
Sources: Activate analysis, Apple announcements, "How Podcasts Have Changed in 10 Years: By the Numbers" by Josh Morgan, iTunes store

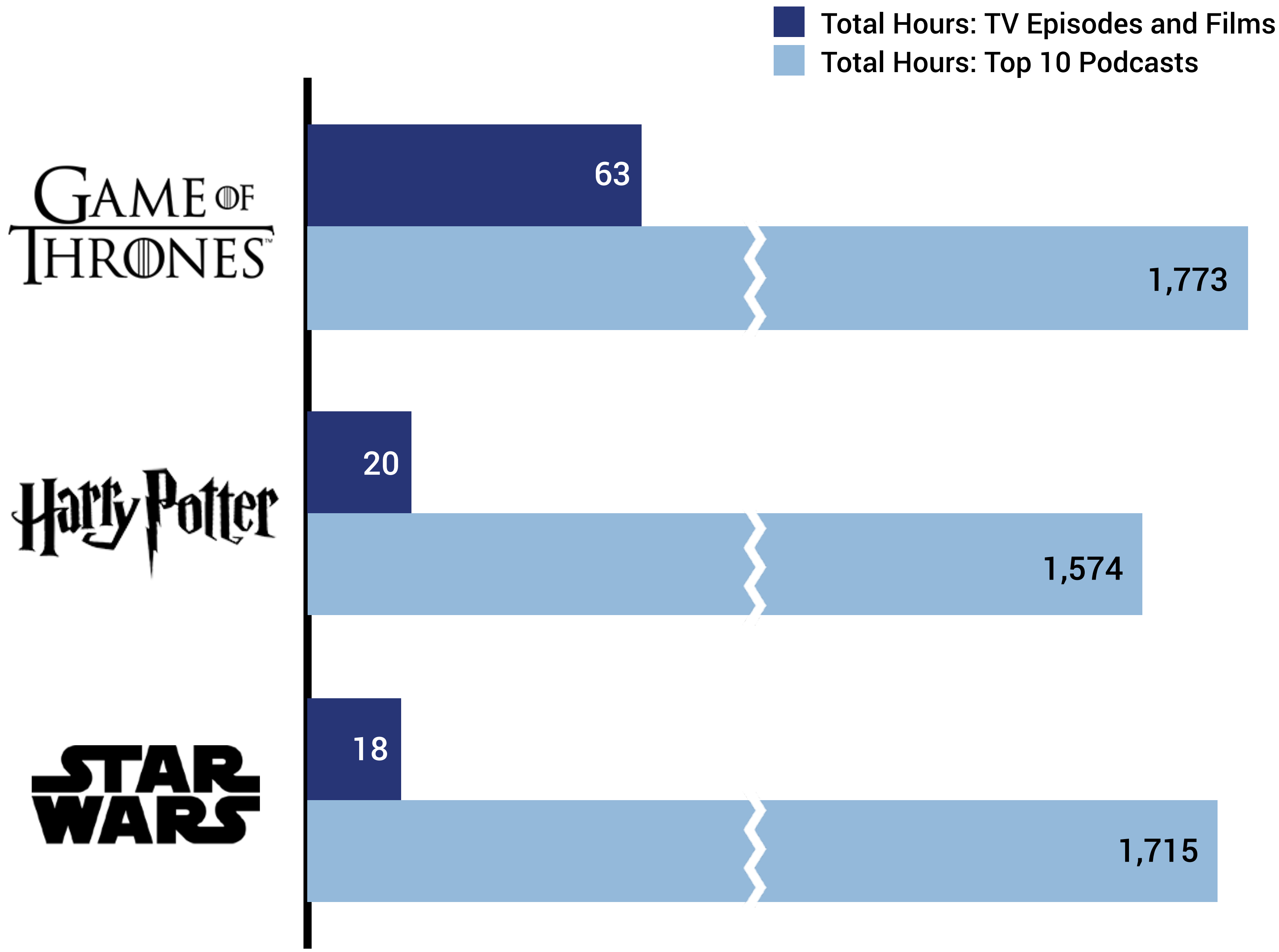
This increased listening is despite the fact that discovery is difficult today; easier discovery will accelerate and expand listening growth



1. Most non-listeners who selected “other” indicated that they were not interested or did not have enough time.
2. Most listeners who selected “other” indicated that they did not have enough time or desired more relevant content.
Sources: Activate analysis, Activate 2017 Consumer Tech & Media Research Study (Left: n=700; Right: n=419)

Podcasts are amplifying hit entertainment properties – inspired fans and influencers are producing their own podcasts and cultivating interest between franchise releases

TOTAL HOURS OF STUDIO FRANCHISES AND ASSOCIATED TOP 10 FAN-PRODUCED PODCASTS[1]



Fan-produced podcast "Star Wars Minute" dedicates each episode to critiquing each minute of the Star Wars franchise, and garners 100K+ downloads weekly. This format is used by many other fan-produced podcasts (e.g. Back to the Future, Harry Potter, Indiana Jones, Lord of the Rings).

1. Total hours measured as of October 2017.
Sources: Activate analysis, IMDb, iTunes Store, Movies by Minutes, The Ringer

Every media and tech company will extend their consumer experiences through podcasting

	TRADITIONAL MEDIA COMPANIES	DIGITAL-FIRST MEDIA COMPANIES	ECOMMERCE	CORPORATE BRANDS
COMPANY[1] AND ASSOCIATED PODCAST	npr — HIDDEN BRAIN Los Angeles Times — DIRTY JOHN THE WALL STREET JOURNAL — WSJ TECH NEWS BRIEFING VOGUE — V	THE RINGER — THE BILL SIMMONS PODCAST REFINERY29 — STRONG OPINIONS LOOSELY HELD Vox — The Weeds BuzzFeed — ANOTHER ROUND	ebay — OPEN FOR BUSINESS Blue Apron — WHY WE EAT WHAT WE EAT asos — MY BIG IDEA shopify — SHOPIFY MASTERS	Microsoft — .future Goldman Sachs — Exchanges at Goldman Sachs GE — THE MESSAGE GATORADE — THE SECRET TO VICTORY
APPARENT BUSINESS STRATEGY	**LEVERAGE PODCASTS AS A PROMOTIONAL TOOL** • Super-serve loyalists • Tap new potential customer segments • Drive subscriptions • Increase donations - NPR has the highest audience share among media companies/publishers with 13.3M monthly uniques and 99M global downloads[2]	**DRIVE INCREMENTAL REVENUE** • Mid-roll ads within podcasts - Native advertising format supports higher engagement • Grow advertising revenue by increasing traffic to core site • Podcast-first companies (networks) may extend reach to digital platforms — Crooked Media has launched a website • Crowdfunding for lesser-known creators	**PROPEL BUSINESS VALUE** • Deepen customer relationships • Win new fans and attract new marketplace participants • Provide education and guidance for better buying and selling • Build a lifestyle brand • Promote live events	**SUPPORT OVERALL BUSINESS STRATEGY** • Boost brand and industry awareness • Earn fans and form deeper connections through storytelling via sponsored content • Develop talent pipeline • Showcase thought leadership

1. For story development and production, eBay, Blue Apron, Gatorade, and Microsoft partnered with Gimlet, and GE partnered with Panoply.
2. NPR metrics were for the month of September 2017.
Sources: Activate analysis, Podtrac

A number of hit podcasts – with large audiences and multi-platform appeal – will extend into video

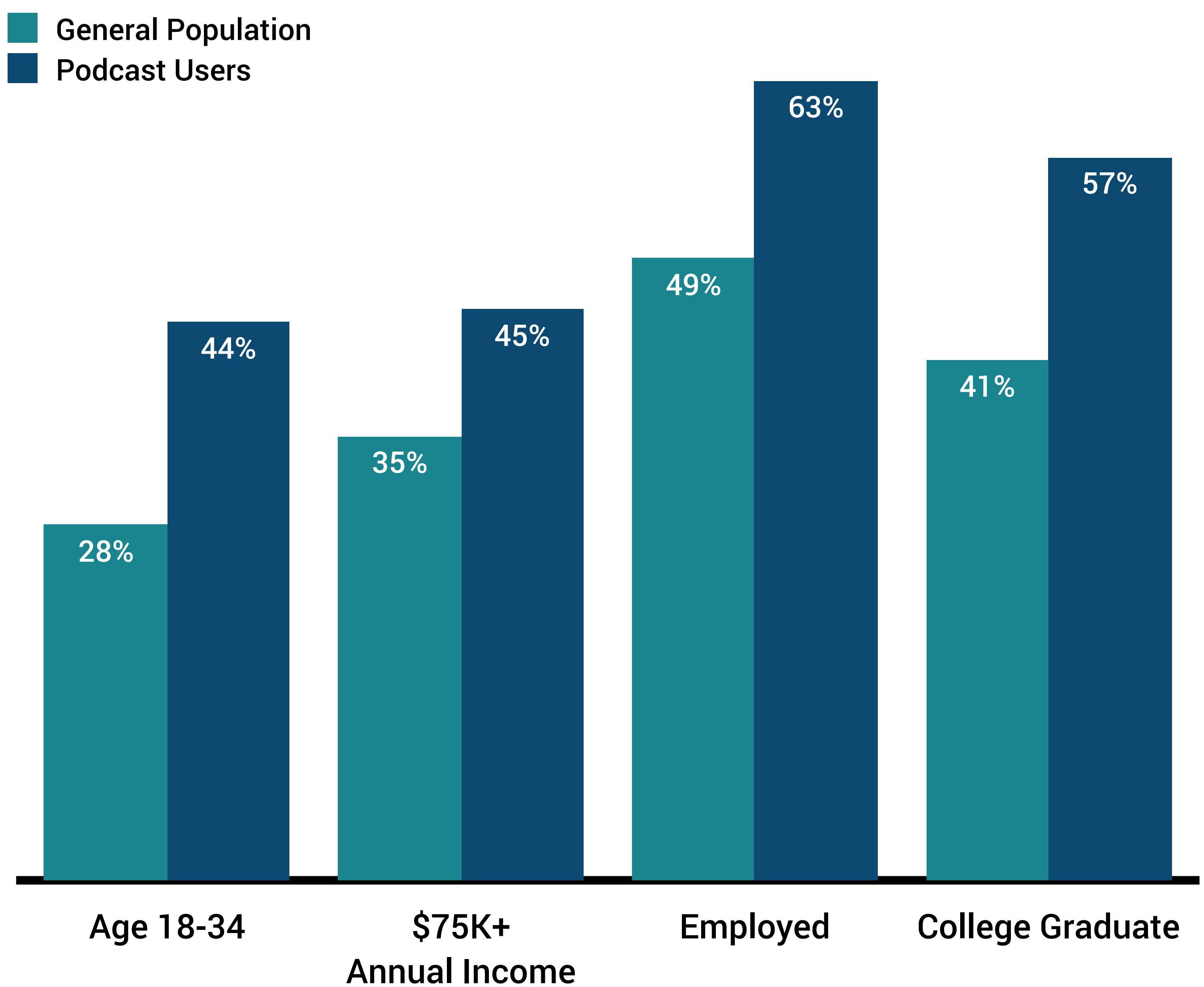
PODCAST	VIDEO DISTRIBUTOR	PODCAST	VIDEO DISTRIBUTOR
LORE	amazon SERIES PREMIERED IN 2017	StartUp	abc SERIES TO PREMIERE IN 2018
SERIAL	fox21 television studios. SERIES OPTIONED	2 Dope Queens	HBO SERIES IN DEVELOPMENT
Watch the Thrones	HBO SERIES ON HBO IN 2016[1]	Gimlet Homecoming	amazon SERIES IN DEVELOPMENT
WTF with Marc Maron	IFC SERIES RUN 2013 - 2016	PODCAST: Nerdist	BBC AMERICA SERIES RUN 2011 - 2013
Throwing Shade	TV LAND SERIES PREMIERED IN 2017	Reply All (Gimlet)	ANNAPURNA PICTURES MOVIE ANNOUNCED

- Distributors are optioning successful podcasts as a source of new programming
- WME signed Panoply in September 2017 to adapt podcasts in its network to video
- Digital publishers could create podcasts to seed new ideas before investing significant resources
- While some podcast creators may realize their multi-platform potential, not all content will successfully transition to video

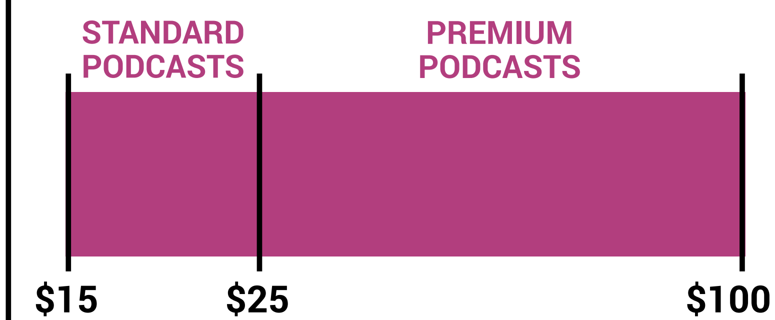
1. HBO cancelled show after 2016 season; The Ringer relaunched it as a live streaming show on Periscope (Talk the Thrones).
Sources: Activate analysis, The Hollywood Reporter, IMDb, Variety

Podcast listeners are highly valuable to advertisers, despite measurement challenges – the top podcasts command high CPMs

COMPARISON OF DEMOGRAPHICS[1], U.S., 2017, % GENERAL POPULATION VS. PODCAST LISTENERS



CPM RANGES

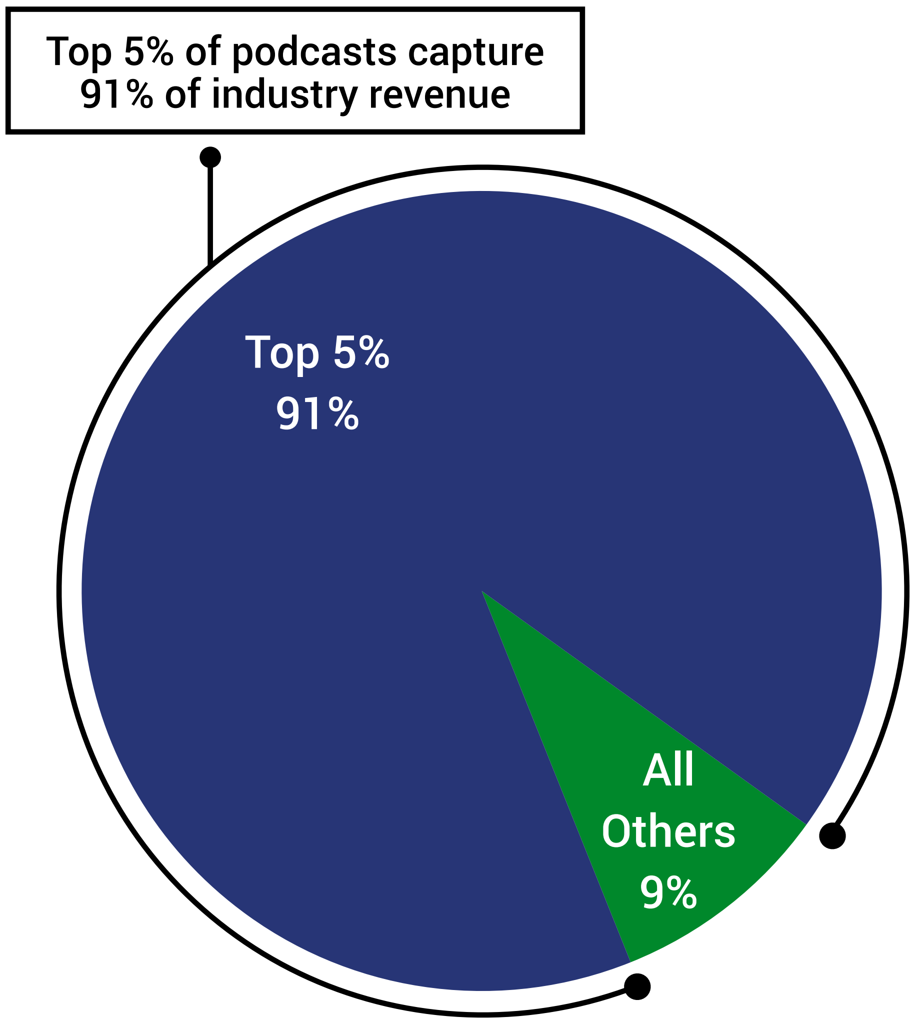


Note: Mid-roll podcast ads command a slight premium over pre-roll ads

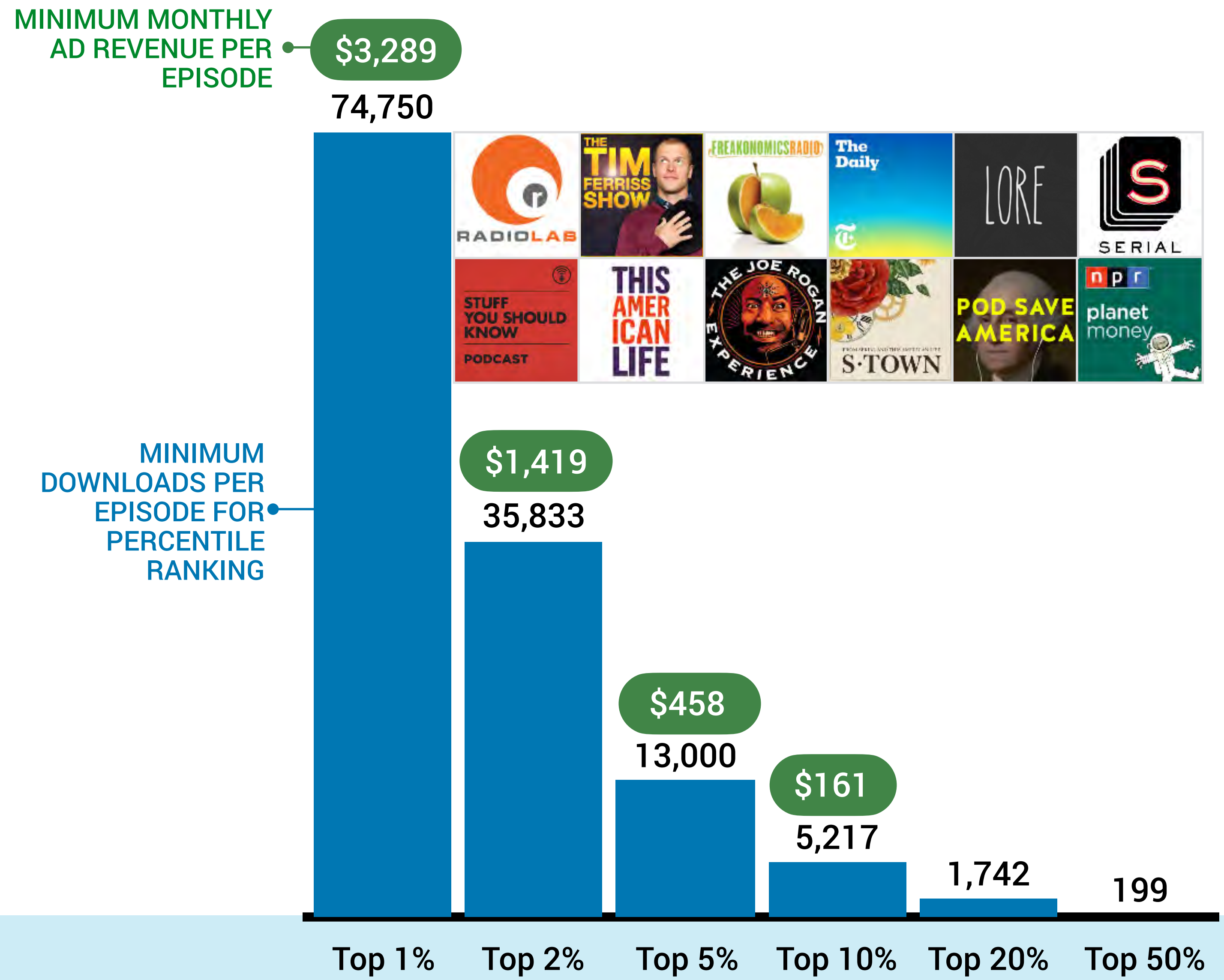
- Two-thirds of podcast listeners engage in purchase-related behaviors after hearing podcast ads
- Podcast users spend ~27% more on eCommerce and ~9% more on consumer electronics than the general population

Only the top media companies and individual creators have sufficient scale to capture ad revenues

INDUSTRY AD REVENUE BREAKDOWN[1] BY PERCENTILE, GLOBAL, TTM JUL 2017, %



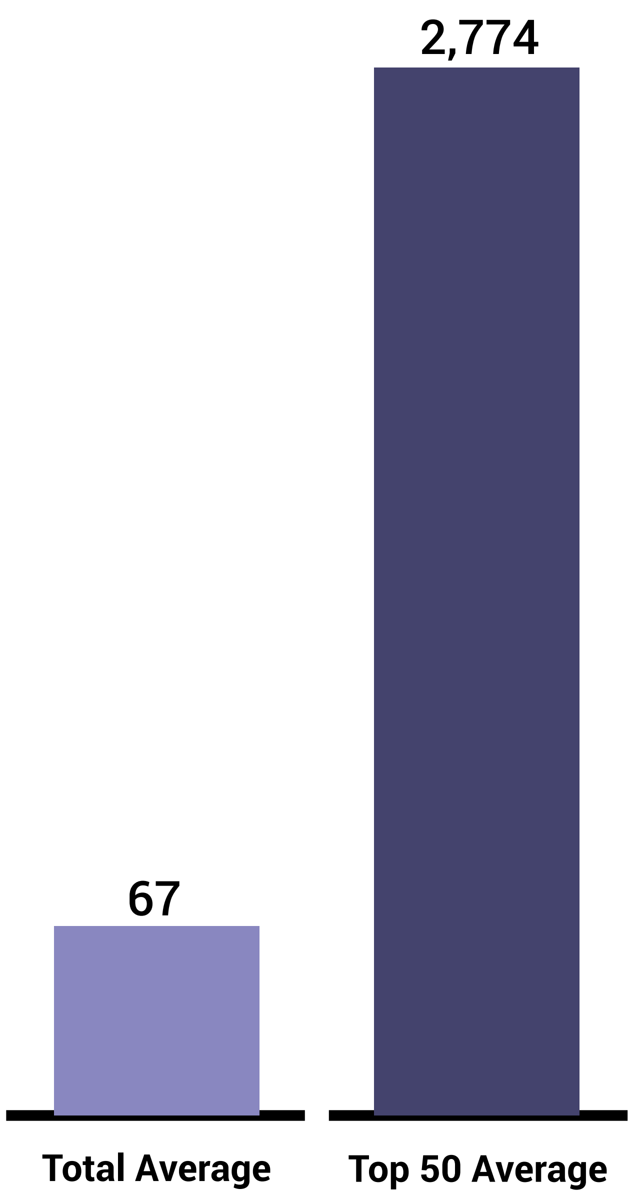
MINIMUM EPISODE DOWNLOADS AND EPISODIC AD REVENUE BY PERCENTILE, GLOBAL, TTM JUL 2017, DOWNLOADS, USD



Note: Average of metrics reported on Libsyn's The Feed podcast for August 2016 - July 2017. Downloads measured through the end of the following month (episodes are 45 days on average). According to Libsyn, brands typically advertise on podcasts with at least 5,000 downloads per episode. Podcasts were included if active for at least one month during the August 2016 - July 2017 period.
1. Industry revenue is concentrated in the top 10% — long tail ad revenue is immaterial.
Sources: Activate analysis, Libsyn

Other podcast creators will get funding from listeners through emerging crowdfunding platforms such as Patreon

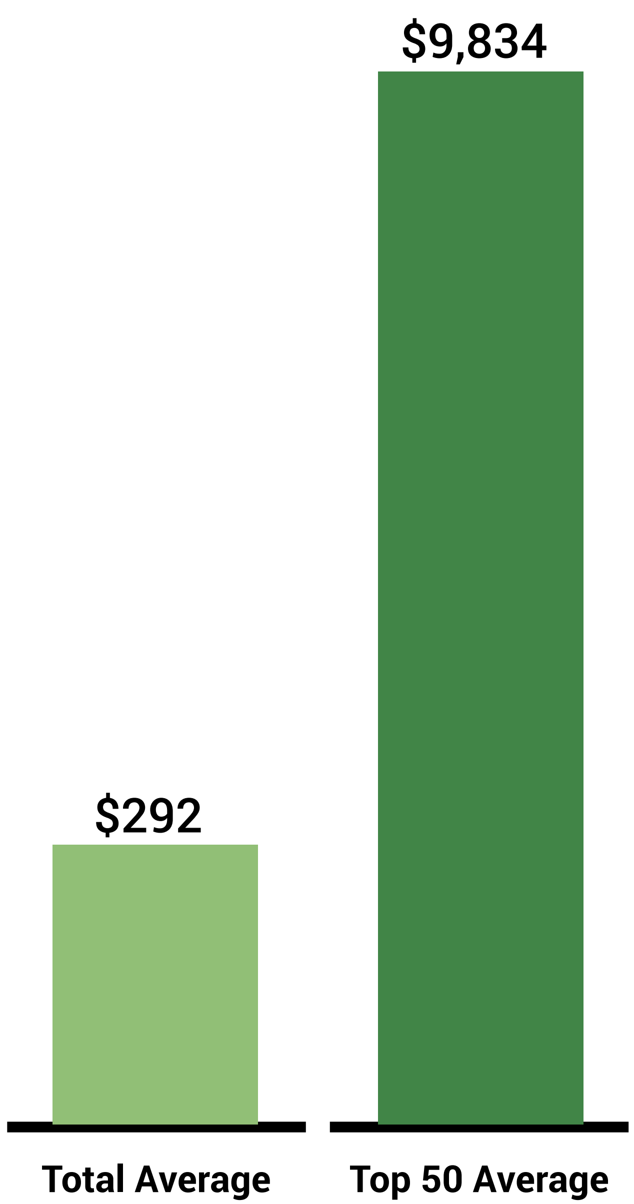
AVERAGE PATRONS AMONG TOTAL[1] AND TOP 50 PATREON | CREATORS



TOP 10 PATREON | CREATORS BY NUMBER OF PATRONS

CHAPO TRAP HOUSE	19,091
SAM HARRIS	9,387
SECOND CAPTAINS	8,236
S&S	6,364
DAILY TECH NEWS SHOW	4,977
THE FANTASY FOOTBALLERS	4,842
THE LAST PODCAST ON THE LEFT	4,429
THE POD	4,002
THE LITURGISTS	3,691
SLEEP WITH ME PODCAST	3,336

MONTHLY EARNINGS AMONG TOTAL[2] AND TOP 50 PATREON | CREATORS



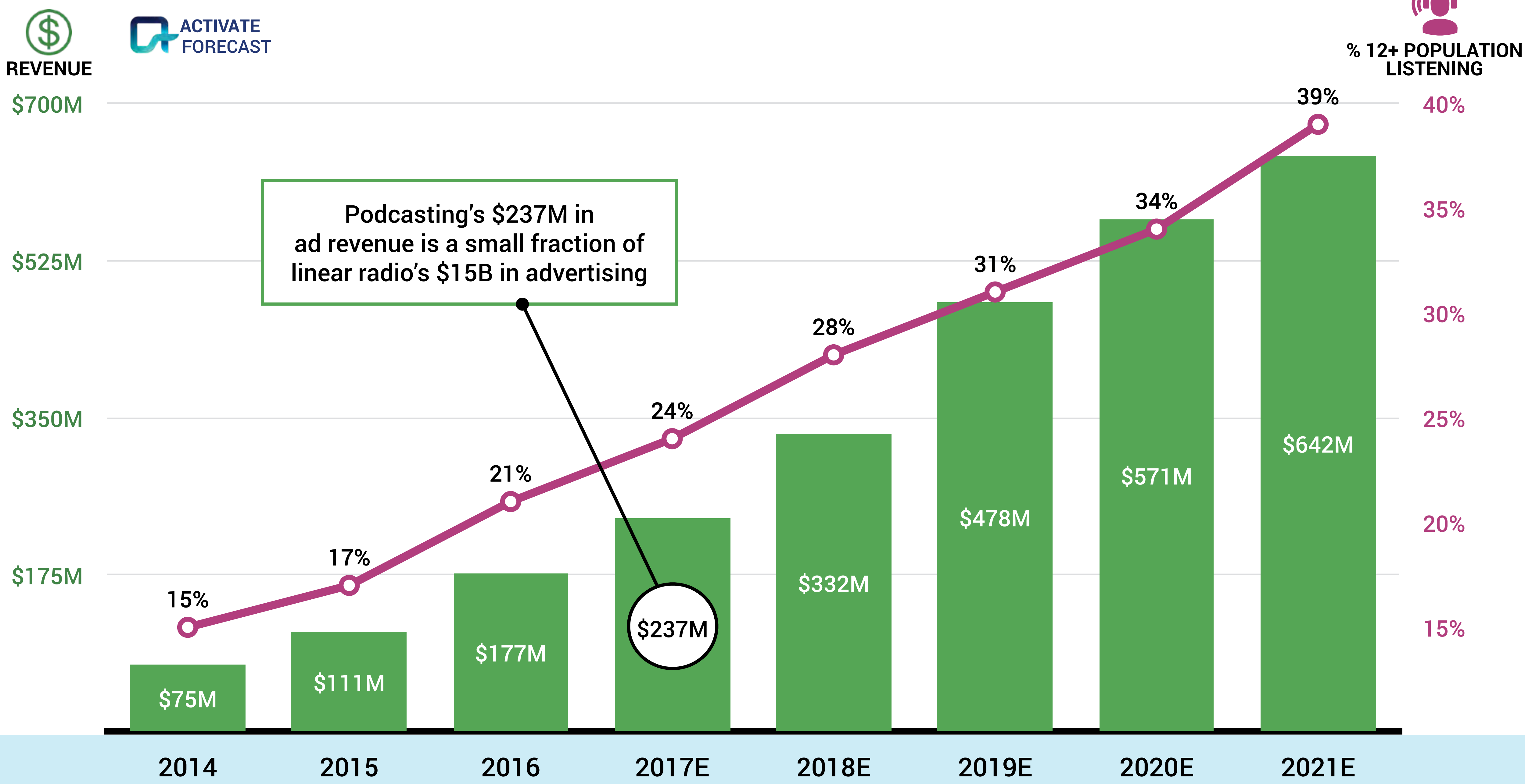
TOP 10 PATREON | CREATORS BY MONTHLY EARNINGS

CHAPO TRAP HOUSE	$84,798
THE LAST PODCAST ON THE LEFT	$24,956
THE BEST SHOW	$23,619
DAILY TECH NEWS SHOW	$20,330
DICK MASTERSON	$19,289
THE POD	$18,781
THE LITURGISTS	$17,752
DOUGHBOYS	$14,569
CANADALAND	$13,594
FRIENDS AT THE TABLE	$12,939

Note: Number of patrons/earnings reported as of October 1, 2017. Creators must have at least one patron to be included. Creators may also receive funding directly through owned websites.1. Total average number of patrons for all creators is based on 4,916 creators. 2. The monthly earnings average for all creators is based on the 4,174 creators reporting earnings.
Sources: Activate analysis, Graphtreon, Patreon

We forecast that the podcast revenues will more than double in the next few years, falling way short of its potential given audience size

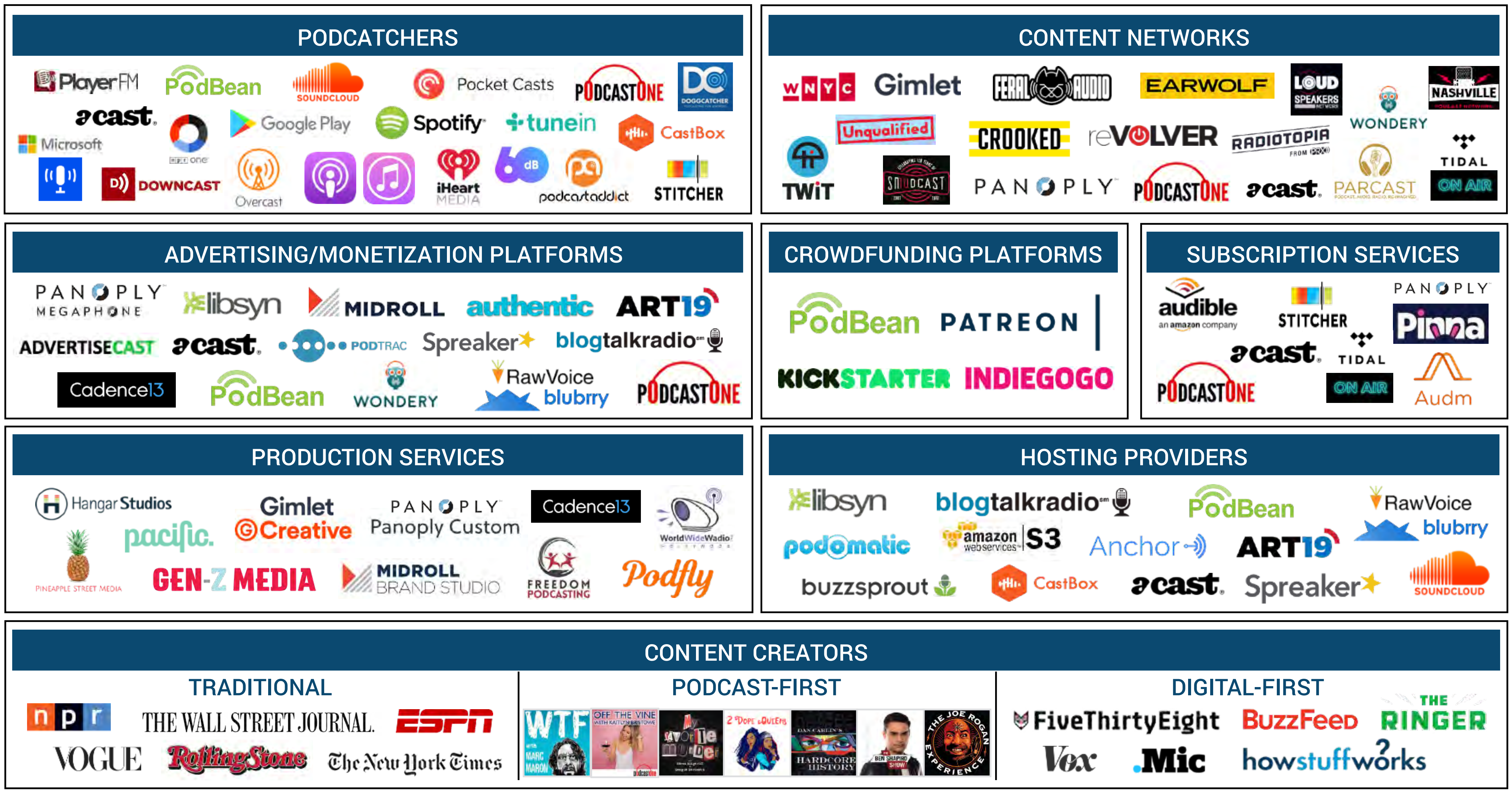
PODCAST AD REVENUE AND LISTENERS, U.S., 2014-2021E, MILLIONS USD, % 12+ POPULATION



Sources: Activate analysis, Bridge Ratings, Edison Research

The continued investment in podcasting can be explained by podcasting's impact on media and tech companies, versus the industry's own revenue potential

PODCAST LANDSCAPE



Note: Podcatchers download and aggregate podcasts, while hosting providers assist with storage, sharing, measurement, and production tools. Subscription services offer access to premium content for a monthly fee and crowdfunding platforms enable users to tip creators, which may then also unlock premium content. Production services assist with narrative development and/or technical production. Some ad agencies assist brands in the creation of podcasts, but are not included as a production service entity. A content network is a network of podcasts, often related in theme. Content networks may also provide production services for their podcast creators. Advertising/monetization platforms serve as a marketplace and typically offer ad insertion, targeting, and measurement capabilities. Podcast creators may be independent or part of a content network and/or use an advertising platform. Some content creators have developed podcatcher apps that only include a curated selection of podcasts. Midroll, Stitcher, and Earwolf are owned by Scripps. Slate owns Panoply. Nashville Podcast Network is owned by iHeartMedia. Hubbard Broadcasting partially owns Podcast One. 60dB is a recent Google acqui-hire.

Source: Activate analysis

activate

Activate Data Partners for Tech & Media Outlook 2018

KEY DATA PARTNERS

Activate: we are the leading management consulting firm for technology, media, entertainment and consumer companies

ACTIVATE'S CAPABILITIES

GROWTH STRATEGY

Help CEOs and senior executives define strategies to position their companies for growth. Identify and exploit new opportunities, take advantage of the innovation, platforms, businesses, content and technology reshaping these industries.

DIGITAL STRATEGY

Formulate strategies and identify opportunities to create new user experiences, products and services that underpin growth businesses, revenue streams and user bases.

NEW DIGITAL BUSINESSES AND PRODUCTS

Create new businesses as 'virtual startups' within large companies. Leverage content, technology and experiences to take advantage of the native capabilities of devices and platforms.

PRICING

Develop new pricing structures and strategies to grow revenues from consumers and b-to-b customers. Expertise include: eCommerce, information services, SAAS businesses, advertising sales, ticketing, payments, and consumer products.

CUSTOMER ACQUISITION AND RETENTION

Leveraging customer, usage, marketing, programming and product information to acquire, grow and retain users, customers and subscribers.

SALES EFFECTIVENESS

Position the sales force and capabilities to grow revenue share: organization, incentives and coverage model; advertising yield and revenue management; new category and customer development; advertiser marketing.

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