

# Content Chain Trends

## Publish, Monetize & Consume

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State of Content Distribution & Monetization



Content Distribution & Monetization - Tech Trends



# Contents of this Report



# State of Content Distribution & Monetization





# Content Distribution & Monetization

## State of the Industry

The shift in viewing habits and the proliferation of new streaming services were accelerated by the COVID-19 pandemic; consumers tried new streaming services and liked them, resulting in fragmentation of viewing and subscription stacking. At the same time, media companies - of which the large majority already provide their own streaming services - continue to seek balance between linear and digital media offerings and business models by streamlining their old linear workflows, while supporting and investing in new digital technologies. According to IABM research, media companies share a common view on a hybrid future of their businesses, bridging linear and digital. This translates into the increasing importance of, and investment in, cloud computing, enabling SaaS-based business models and the use of cross-platform audience measurement systems - the key in integrating linear advertising management into VOD and OTT. Our recent data confirms this - Cloud computing, Software (Subscriptions) and Software (On-Demand) remain as the top tech investment categories. In digital, programmatic advertising already accounts for the large majority of ad buying, mainly focusing on streaming services and VOD sold across connected TVs and digital video channels. This report focuses on identifying the most important investment drivers in Publish, Monetize and Consume derived from a mixture of sources, including survey data on technology priorities, company announcements, and financial data.



# Content Distribution & Monetization

## State of the Industry

Content distribution and monetization have been forever changed by the streaming boom of 2020 as well as by specific trends such as the demand for interactivity driven by the pandemic. The significant growth of streaming platforms has accelerated the adoption of different technology business models in distribution while hitting legacy revenues. The new paradigm features a deeper alignment between customer and supplier objectives and is built around various customer success metrics. When it comes to the specific trends triggered by the pandemic, the increasing demand for interactive experiences is arguably the most important and is causing a convergence between sectors that were more clearly separated pre-pandemic. Monetization from interactive experiences is linked with improved data capabilities at media businesses and is predicated on data gathering, as shown by recent initiatives. Data is also key in subscription and advertising models, as shown by IABM's research on these segments. In subscription-based models, data is increasingly being leveraged to manage churn and improve customer retention. In advertising, media businesses are working on hybrid offerings to differentiate themselves from the digital giants.

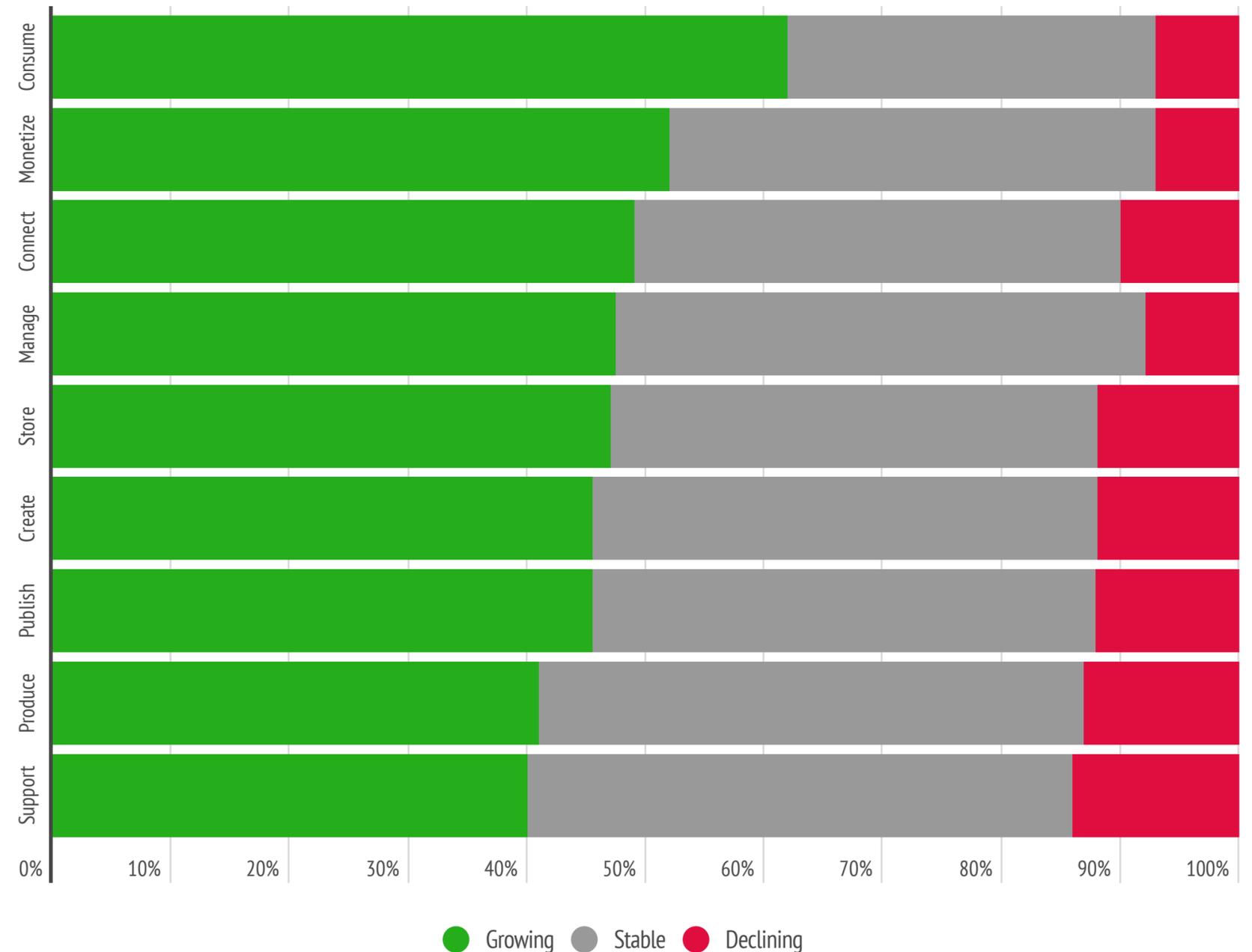


# Content Distribution & Monetization

## Investment in Publish, Consume and Monetize

From an investment perspective, Consume remains the fastest-growing segment in the industry, followed by Monetize. The importance of these two segments has been growing as media companies have moved to DTC platforms, making them their utmost priority. Media companies' investment in these areas is often linked with improving consumer experiences as well as focusing on revenue-generating activities. Publish is instead the third from the bottom category in the investment ranking as media companies retreat from legacy distribution infrastructures in favor of new delivery mechanisms.

### Content Supply Chain Investment Outlook



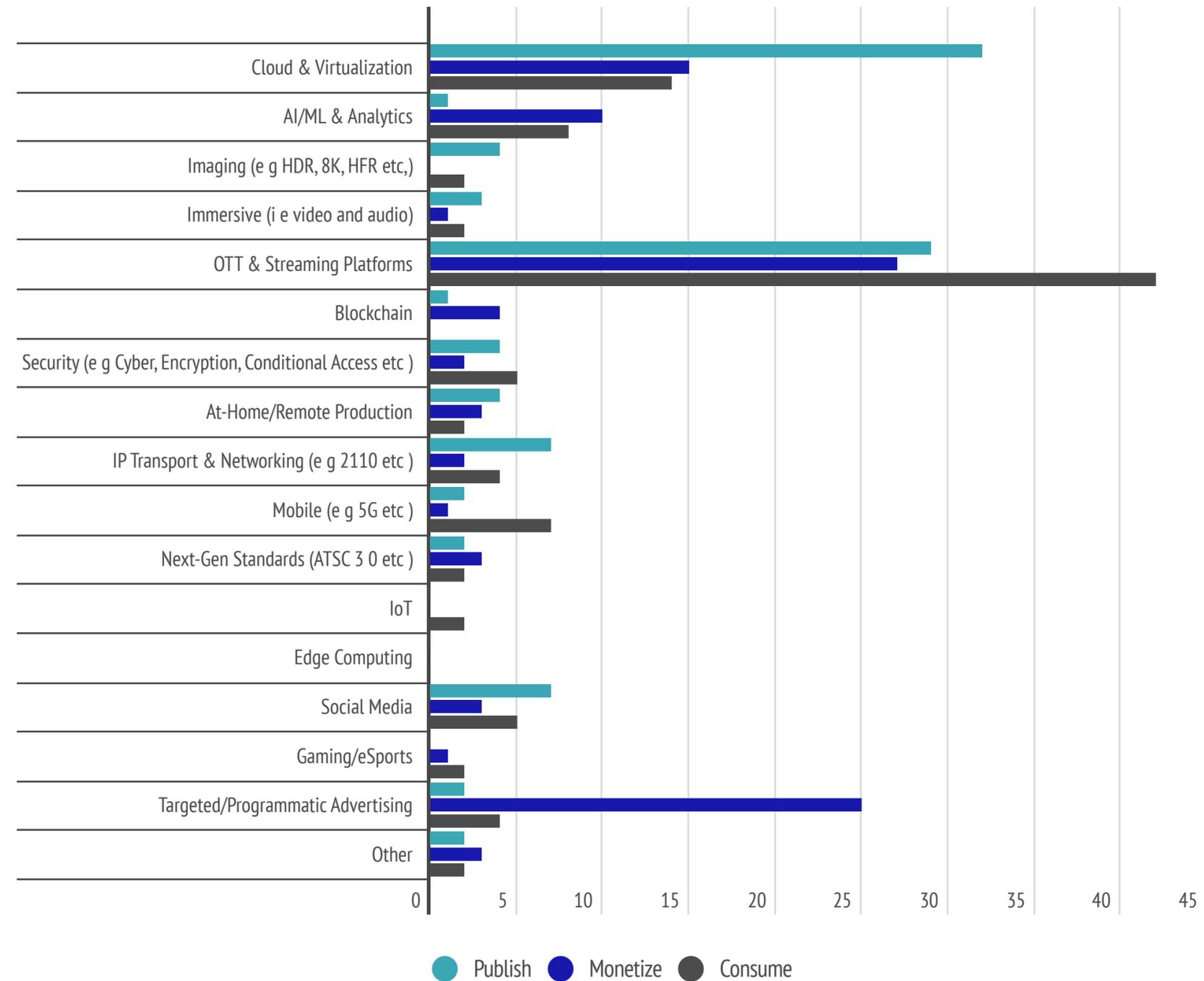


# Content Distribution & Monetization

## Investment drivers

IABM data shows that investment in Consume is overwhelmingly driven by the transition to DTC platforms. This is a major trend for Publish and Monetize as well, though these segments present other spending drivers too. In Monetize, the move to targeted/programmatic platforms is the second most important investment driver, as media companies increasingly leverage data in revenue-generating activities. In Publish, cloud and virtualization have significantly reduced the cost of distribution, making them the most important driver in the segment. AI/ML and analytics are also important, particularly for Consume and Monetize.

### Investment Drivers in Publish, Monetize & Consume



Sources: IABM



# Content Distribution & Monetization

## Investment drivers - Publish



Streaming boom has produced significant growth in technology solutions underpinning OTT platforms



Business model differentiation provides an avenue to circumvent price compression in some categories



Increasing demand for software development and consulting for OTT platform builds



Investment in traditional distribution methods is declining



Price compression in legacy categories



Declining investment in hardware-based offerings which have represented a large share of revenues in this segment



# Content Distribution & Monetization

## Investment drivers - Monetize & Consume



Move to DTC platforms driving increasing investment in these segments



Importance of consumer engagement data driving business model innovation and differentiation



Hybrid business models offer differentiation as well, including cross-selling across distribution platforms



Ad budgets migrating from linear to digital mediums



Some media companies insourcing mission-critical systems, and particularly ad tech



Fragmented landscape posing challenges to consumers and businesses alike

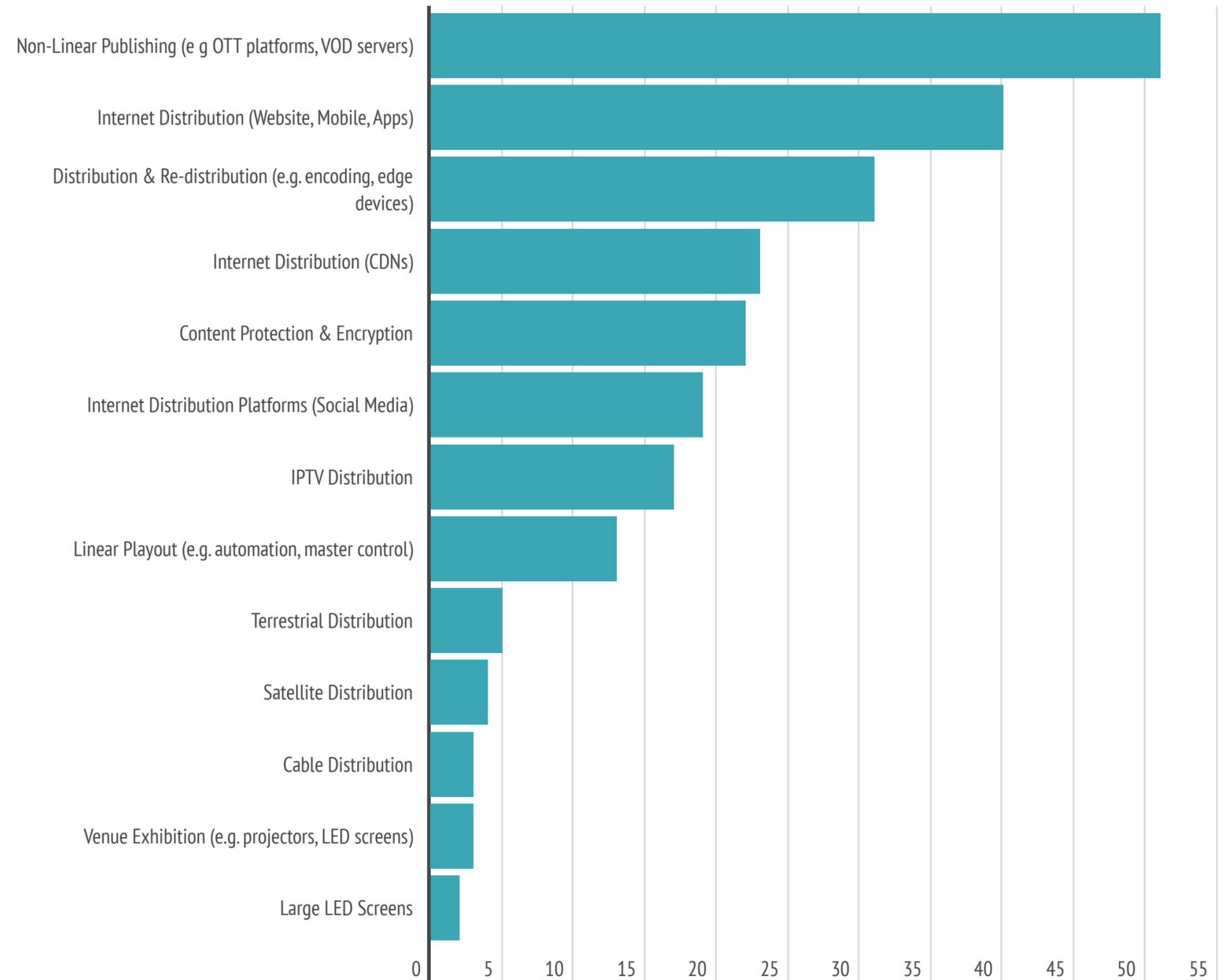


# Content Distribution & Monetization

## Top areas of investment in Publish

The top investment area in Publish is non-linear publishing, followed by internet distribution and distribution and re-distribution. Most of the categories at the top of this investment ranking are about internet distribution - three of the top four - while the bottom categories are associated with legacy distribution methods typical of Pay-TV models, such as cable and satellite. This polarization in investment has been driven by the move to DTC platforms as well as the increasing pervasiveness of cloud-based technology in distribution. Legacy infrastructure is still attracting investment, though media businesses are focusing on doing more with less in traditional areas.

Top Investment Areas in Publish



Sources: IABM

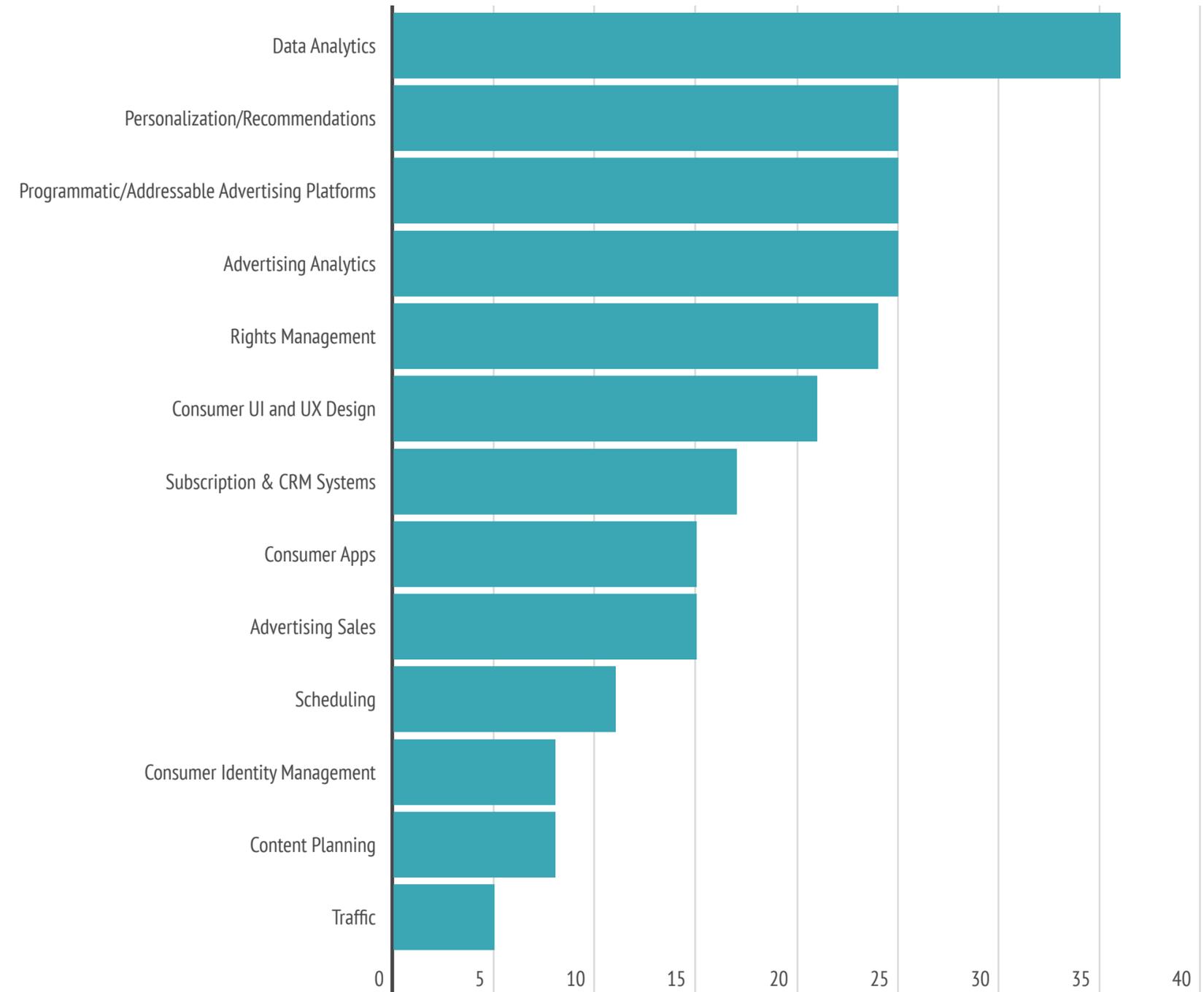


# Content Distribution & Monetization

## Top areas of investment in Monetize & Consume

The top investment area in Monetize and Consume is data analytics, followed by personalization and recommendation systems, programmatic and addressable advertising platforms, and advertising analytics. The common denominator of all these activities is data, which has become a more important commodity for media businesses as they have moved to DTC platforms. While content planning (i.e., data analytics tools linking content consumption trends with content investment decision-making) is still an immature activity at media companies, it is interesting to see that even in these segments, there is a polarization between linear and digital activities. In fact, legacy solutions such as traffic and scheduling systems sit at the bottom of this ranking.

### Top Investment Areas in Monetize & Consume



Sources: IABM



## Streaming boom

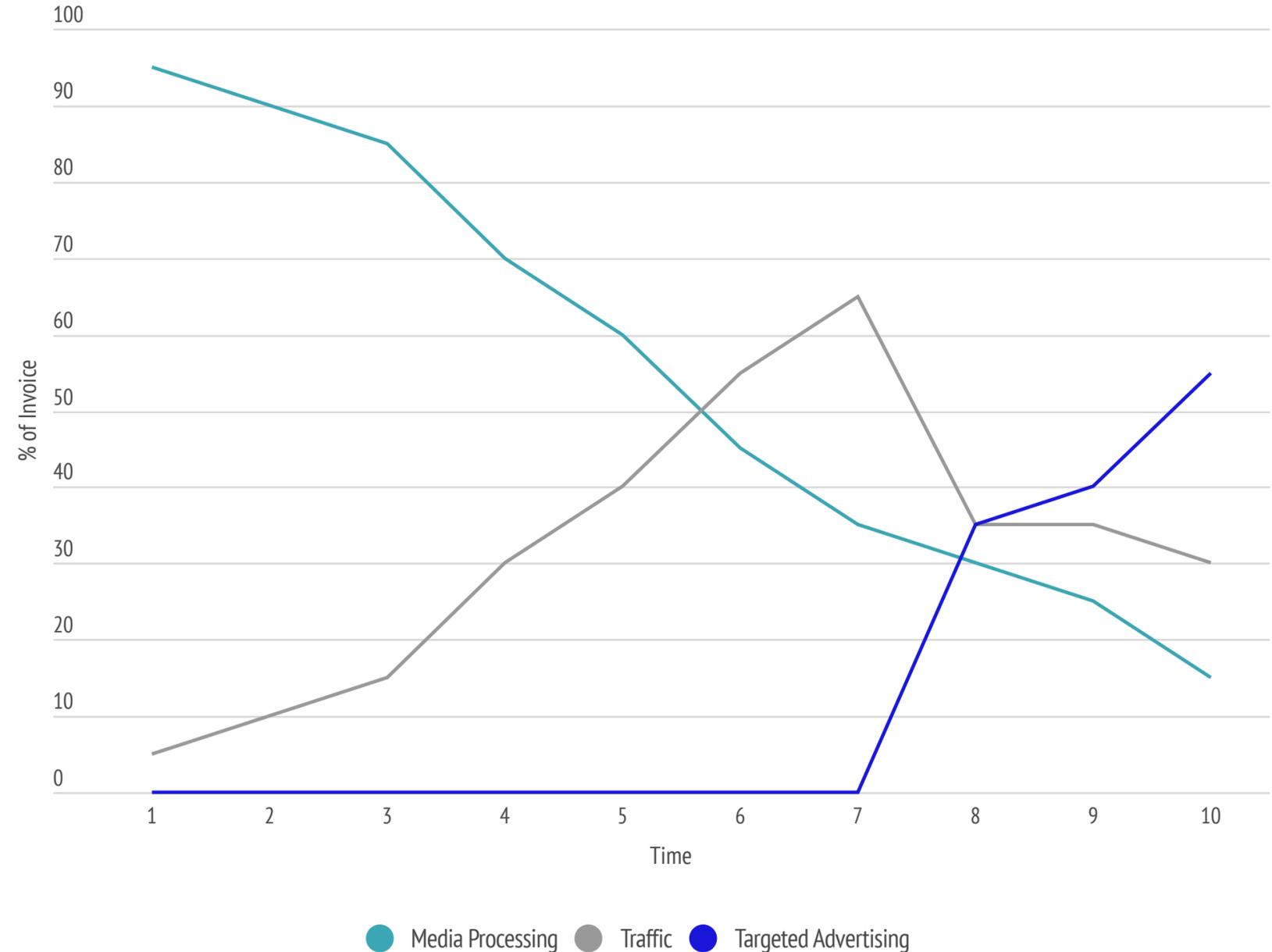
The streaming boom of 2020 has arguably changed the industry forever. Most media businesses have accelerated investment in their digital platforms due to rapidly shifting consumer habits, which has, in turn, affected the demand patterns for media technology. As an example of this, Harmonic reported in Q2 2021 that its streaming SaaS revenues had grown by 68% year-on-year. In its special call with investors in June 2021, Harmonic's SVP of Video Products & Corporate Development, Shahar Bar, described the economics behind streaming distribution infrastructure as being made up of three major elements: media processing, packaging and origin, and targeted advertising. This is a truly variable model as revenues hinge on indicators such as the number of assets in a library, the number of events/channels delivered, the size of the viewership, as well as the number of ad impressions. Interestingly, Harmonic said that as the popularity of the streaming platforms they serve rises, the share of media processing spending decreases, while the portion of investment going into elements such as targeted ads increases. This illustrates that streaming technology business models closely follow customer revenue-generating activities as they move towards Opex implementations, deepening the linkages between supply and demand. In the case of Harmonic, the media processing that was traditionally sold as Capex has arguably become a stepping stone for new business models.

# Content Distribution & Monetization



## Streaming boom

Illustrative trend in streaming technology pricing based on Harmonic's observations



The chart on this page is only illustrative of Harmonic's observations on streaming technology pricing - i.e., it is based on fictitious data to visualize the conceptual pricing trend. In Shahar Bar's words: *"If a greenfield streaming platform starts out, typically, the first month of invoice will be almost entirely media processing. As they grow, as they get more subscribers, the traffic one [share of the invoice], will start to grow. And at the right time, they may and very likely will introduce targeted advertising, at which point, we will start to see the ad part of the invoice, grow."* Traffic and targeted advertising are therefore dependent on customer success.

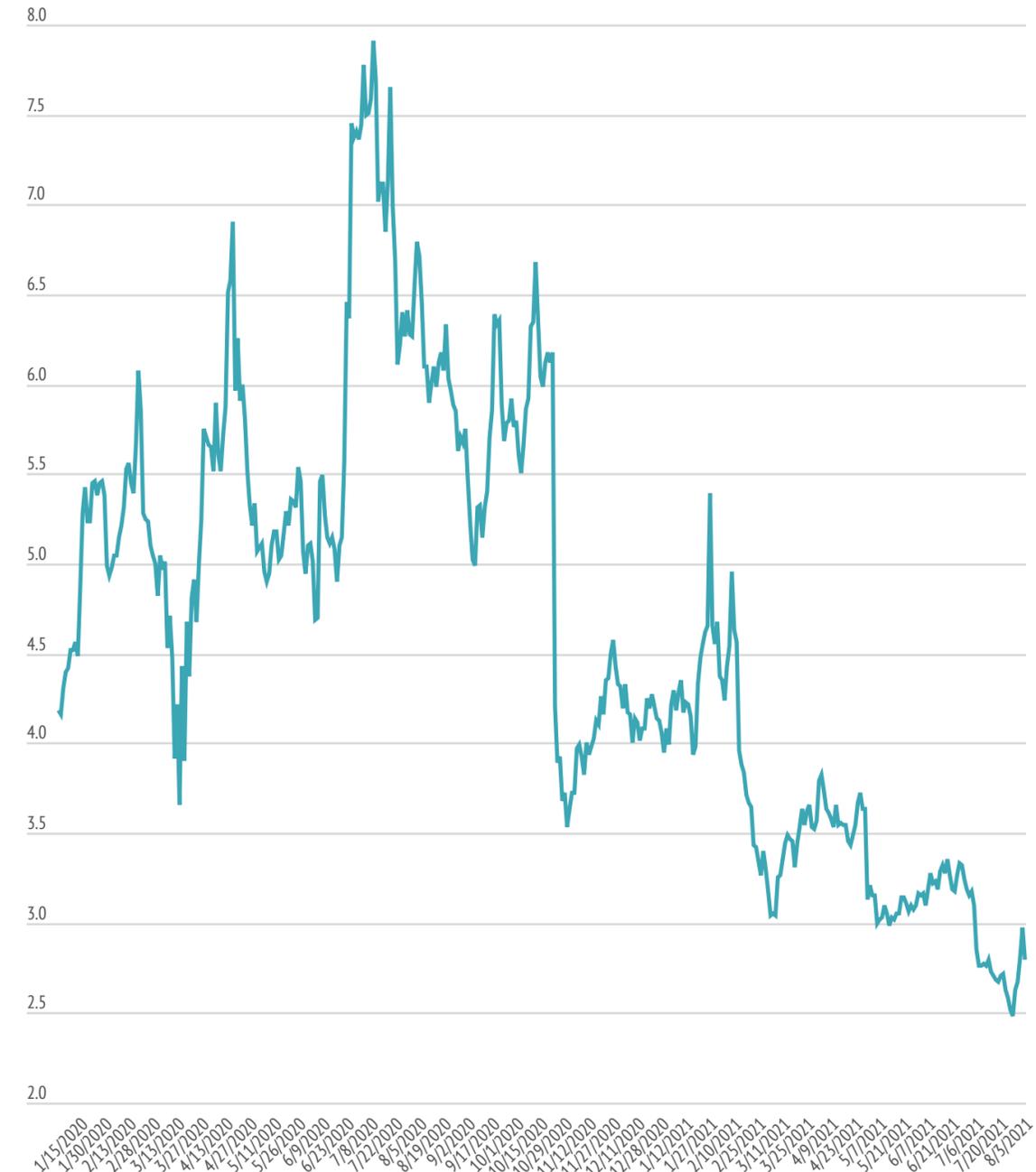


# Content Distribution & Monetization

## Streaming boom

Another example of the variability of streaming economics is provided by CDNs. The stock price of Limelight Networks boomed in the first half of 2020, retreating in the second half when subscriber growth at major streamers such as Netflix slowed down as well - Netflix's subscribers grew by 1% in Q3 2020, from 6% in Q2 2020. Limelight highlighted the effects of volatile streaming patterns on its financials in recent earnings calls, also pointing out the polarized utilization of its networks driven by peak consumption of streaming services. Daniel Boncel, Limelight CFO, said of this at the company's Q2 2021 earnings call: *"Our largely fixed cost structure, coupled with a concentration of large video streaming clients results in the suboptimal network utilization. Our network has a high demand for a relatively short period of 4 to 6 hours each evening in each region. While this remains true, our cash gross margin will have a high sensitivity to overall demand patterns and network utilization."*

Limelight stock price, 2020-2021





## The power of engagement

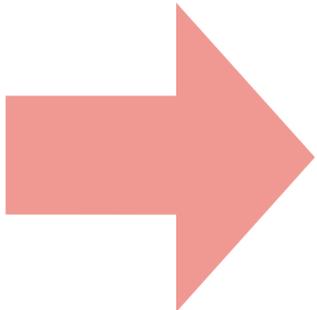
Limelight's case study really illustrates the deep relationship between consumer habits and technology investment in streaming economic models. Akamai, another CDN service serving the media industry, expanded on this relationship when Edward McGowan, Akamai's CFO, said: *"There's not a direct correlation [of business success] to the number of subscribers per se. Think of it more of like the gym membership. We might have 5,000 people show up at the gym, but only 2,000 go on a regular basis. We make more money off of people that go on a regular basis... So the greater the adoption, the longer engagement times, that's generally beneficial for the CDN providers."* Even in this case, customer and supplier objectives had never been so aligned. In fact, engagement is a key metric in most media business models, particularly because of its positive relationship with customer retention and advertising rates. With engagement also driving technology revenues in Opex-based models, there is an important alignment between customer and supplier success. Interestingly, the increasing demand for customer interactivity spurred by the pandemic has been driving media businesses to focus much more significantly on solutions that boost customer engagement. Aside from its relationship with revenue-generating activities such as subscriptions and advertising, media businesses are doubling down on engagement also to drive customer data gathering and differentiate their business models beyond the SVOD and AVOD supremacy.

# Content Distribution & Monetization

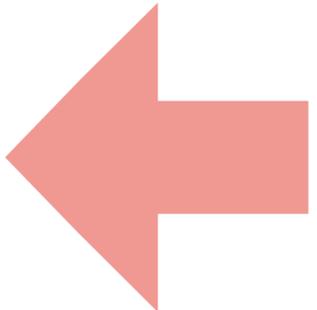


## The power of engagement

**Demand for interactivity has soared**



**Consumer Interactivity**



**While supply has never been in a better shape**

Social isolation has been driving increasing demand for interactivity



Tech enablers such as AI/ML, 5G/edge, XR facilitate effective supply

The increasing demand for interactivity is reflected by the soaring usage of social platforms such as Twitch and Clubhouse while supply now has many more tools to cater for it compared to years ago.



# Content Distribution & Monetization

## Business models beyond SVOD & AVOD

Media businesses operating in the sports sector have been experimenting with interactive experiences built around the convergence between sectors such as media, betting, and gaming in the last few months. Examples of this trend include companies such as Sinclair and Fox, who have been working on gamification and betting. FuboTV perhaps represents the most interesting case study when it comes to this convergence. FuboTV acquired Vigtory, a sports betting and interactive gaming platform, in January 2021, with FuboTV's CEO David Gandler saying of the acquisition: *"We believe online sports wagering is a highly complementary business to our sports-first live TV streaming platform. We believe there is a real flywheel opportunity with streaming video content and interactivity. We not only expect sports wagering to become a new line of business and source of revenue, but we also expect that it will increase user engagement on FuboTV resulting in higher ad monetization, better subscriber retention, and reduced subscriber acquisition costs."* This illustrates the interplay between interactivity and monetization. At the Needham & Co. Technology & Media Conference in May 2021, FuboTV's CEO added: *"We are very focused on our ability to manage our data and to analyze and leverage that data in ways that will allow us to find new opportunities... Adding wagering, I'm looking for things we can sell that can add \$10 to \$15 to \$20 of monthly revenue per customer."*

# Content Distribution & Monetization



## Business models beyond SVOD & AVOD

FuboTV CEO discusses streaming and interactivity at CNBC

The video frame shows a man in a suit speaking. A stock data overlay for FUBO INC is visible on the right side of the frame. The overlay includes the following information:

- (FUBO) FUBOTV INC
- 29.15
- +1.61 [+5.85%]
- VOL: 8,862,719
- 1-YR [197.45%]
- SEP 1, 2020 - AUG 31, 2021
- MARKET CLOSED

At the bottom of the video frame, there is a blue banner with the text "FUBOTV CEO ON SUBSCRIBER GROWTH". To the left of the banner, there is a logo that says "CLOSING BELL EXCLUSIVE". The CNBC logo is visible in the bottom right corner of the video frame.



# Content Distribution & Monetization

## Business models beyond SVOD & AVOD

This illustrates the potential business model differentiation driven by interactivity, which is built on data and in itself represents a tool to drive more data gathering. This differentiation consists of an interplay between personalization and interactivity that can drive increasing transactional revenues for media businesses, beyond their SVOD and AVOD funding sources. In live events, this seems to be quite a compelling model, as evidenced by the moves of media businesses in this area. Moreover, some initiatives have focused on providing live interactive experiences at a premium. However, it should be noted that gamification can go well beyond live content as well. Netflix hired former Facebook and EA executive Mike Verdu as VP of game development in July 2021. Reportedly, this move aims to develop a gaming offering as part of Netflix's subscription packages, though the company may also rely on gamification to drive other elements of its platform, like content and user experience, as it did with the movie *Bandersnatch* in 2018. Coming back to live, some initiatives have focused on providing live interactive experiences at a premium. Eluvio LIVE priced the 4K Stream + Virtual Meet & Greet package for the Black Eyed Peas concert at \$80, which was \$50 greater than the 4K Stream only. Eluvio LIVE also offers *"dynamic advertising and personalized merchandising initiatives, including interactive points on-screen that allow users to click 'hot-spots' to buy during the event,"* which really underscores the emergence of transactional models in the media industry.



# Content Distribution & Monetization

## Micro commerce

Eluvio LIVE also offers "remonetizing" opportunities, some of which are based on non-fungible tokens (NFTs), to make more effective use of content assets as well as tailor packages to specific users. This is again consistent with a push for more personalized experiences but also with the need to better leverage content archives, a business driver triggered by the pandemic, as evidenced in previous IABM research. Moreover, from a monetization perspective, this is also consistent with a new transition to microtransactions, allowing consumers to pay for relevant sub-segments of a larger piece of content. Something similar is happening on the B2B front when it comes to content syndication. Eluvio LIVE also offers the ability to repurpose content snippets for syndication. Technology supplier Newsbridge offers a "Clip & Collect" tool as part of its monetization solution, allowing users to *"select a specific sequence, then add it to their cart."* Search for specific elements is enabled by an AI-based search engine. This is an interesting example of how even B2B business models are being personalized. This trend is also consistent with the emergence of content marketplaces such as Vuulr. Vuulr raised \$3.5m at the end of 2020, on top of \$2.5m raised in 2019. Vuulr is a global digital platform for trading content rights, applying a 10% commission on sellers' prices for content assets. In a [press release](#) at the end of 2020, the company said that buyers had quadrupled since its launch in January 2020.

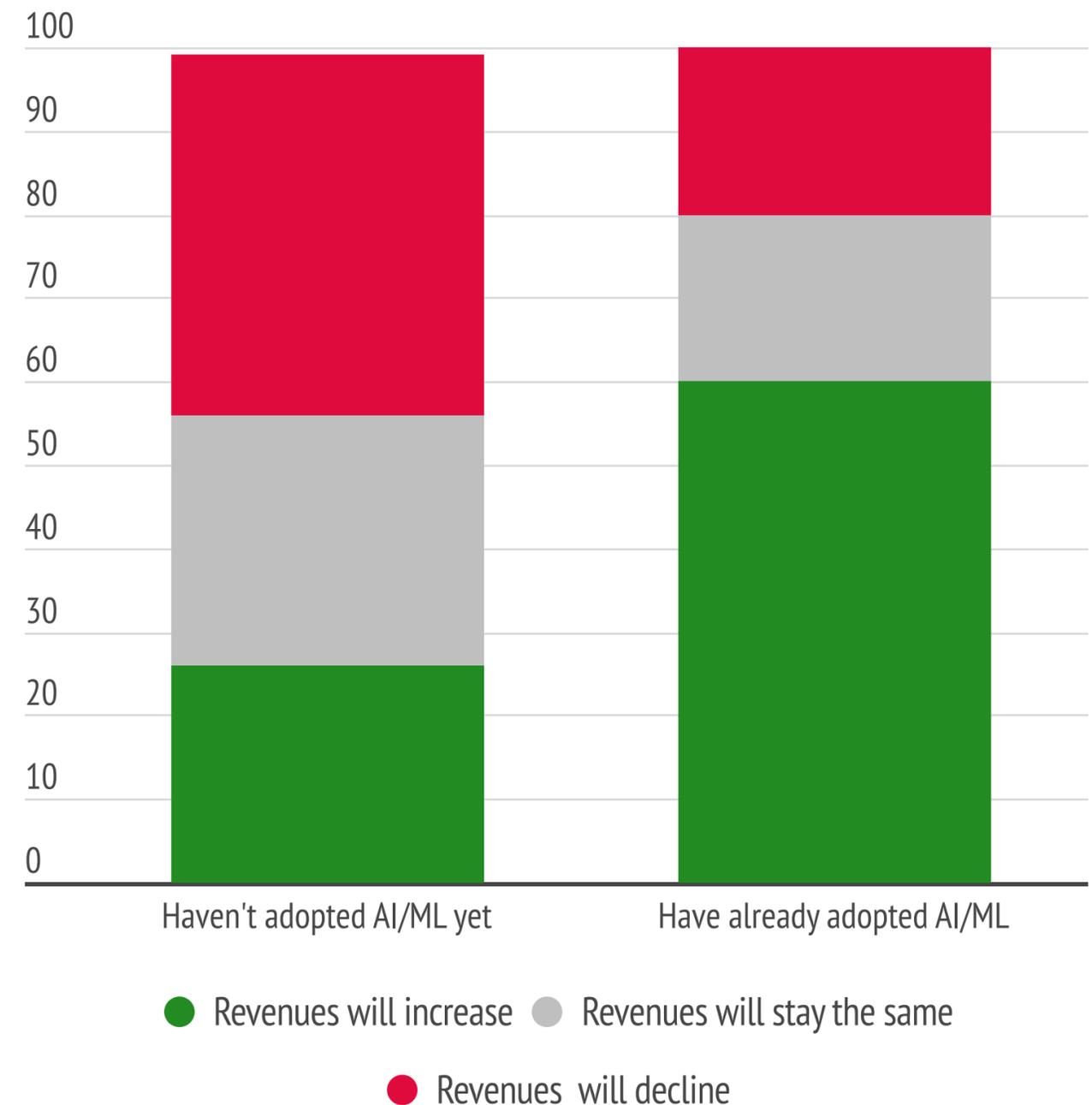


# Content Distribution & Monetization

## SVOD and AVOD hinge on data too

Dominant streaming business models such as SVOD and AVOD hinge on data capabilities too. Data analytics is in fact the fastest-growing activity in Consume and Monetize according to IABM research. IABM research has also reported that media companies that have invested in AI/ML technology are more likely to have a positive revenue outlook and technology budget forecast. Data-driven technologies in this area include analytics for subscriber intelligence and management as well as advertising intelligence and targeting. Media companies have repeatedly told IABM that these areas are in continuous development and are attracting a significant portion of their media technology budgets. Due to the strategic importance of these activities, they are however also vulnerable to insourcing initiatives - ad tech in particular.

### Revenue Outlook for Media Companies



Sources: IABM



# Content Distribution & Monetization

## SVOD still reigns in a fragmented landscape

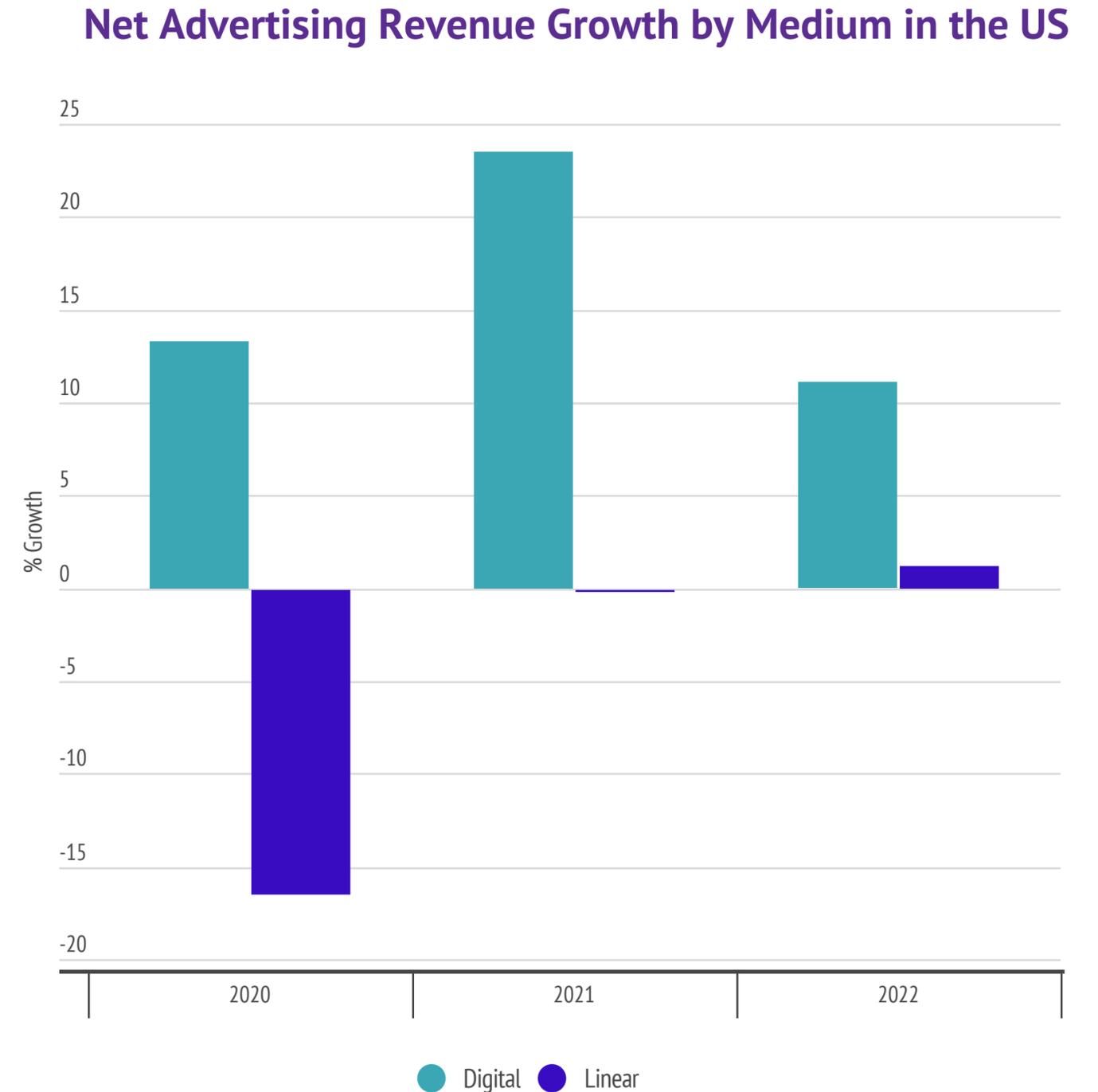
According to a 2021 [PwC survey](#) polling US consumers, 62% of their time in 2020 was spent watching SVOD services compared to 32% spent on AVOD offerings. The most important streaming services remain SVOD offerings with ad-free experiences (and the best/most expensive content), despite the launch of several AVOD initiatives between 2020 and 2021. Despite the dominance of SVOD, AVOD offerings are expected to grow in the next few years. Most importantly, the consumer appetite for aggregation is increasing as more services, including AVOD offerings, enter the media landscape. Unifying these services in a seamless manner has therefore become more important for media companies. This is about managing relationships with direct competitors as well as dealing with a web of technical integrations to deliver optimal consumer experiences. At its Q2 2021 event, FuboTV's CEO David Gandler said about this: *"We have repeatedly asserted that there will be a major shift back to aggregation and bundling as the proliferation of SVOD services becomes increasingly burdensome and costly for consumers. The industry now echoes this view, recently pointing to consumer fatigue as a consequence of actively managing numerous subscriptions and disparate sources of content. We believe that the delivery of a unified, personalized, and interactive streaming experience is the future of this space."* We believe that is to be the case as well.



# Content Distribution & Monetization

## Advertising polarization

Advertising spending was hit by the COVID-19 pandemic in 2020 though it has recovered in 2021. Figures on the US market from Magna though show that this recovery will be much more significant for digital advertising, which is expected to grow by 23.5% in 2021 - digital ads were particularly resilient to the bust cycle of 2020 as well. Interestingly, online video is the fastest-growing digital medium along with social media, which is a testament to the growth of streaming in 2020. Major media businesses such as Disney and ViacomCBS have also reported growth rates of over 100% in their digital advertising division in 2020. The consolidation of commercial players in the fragmented European market (e.g., TF1 and M6) also shows that the future of advertising might be more digital and less linear.





# Content Distribution & Monetization

## Hybrid business models

Despite the diverging fortunes of linear and digital advertising, most media companies regard cross-selling across linear and digital distribution channels as their differentiating factor, particularly when it comes to differentiating themselves from digital advertising giants such as Google and Facebook. This is very much a hybrid model as described in RTL's investor presentation in June 2021: "*Combine the value of TV and digital advertising.*" The company's strategy on this consists of blending the data-driven nature of digital with the mass reach of linear, which can deliver premium pricing over transactional digital platforms. This is consistent with what's happening at other major media companies. In early 2021, Disney unveiled its new Disney Real-Time Ad Exchange (DRAX) platform to enable a "*cross-platform approach to sell its ad inventory on traditional linear TV and increasingly crucial streaming platforms like Hulu.*" As previously reported by IABM, the focus on hybrid not only affects advertising but also other aspects of media business models. In an interview with IABM, Globo's Head of Architecture & Analytics, Carlos Octavio, also talked about his company's intention to deliver hybrid TV experiences, blending linear and on-demand experiences more seamlessly. We could also argue that media companies' attempt to move beyond SVOD and AVOD models is also consistent with the push towards hybrid business models for differentiation.

# Content Distribution & Monetization

## Tech Trends



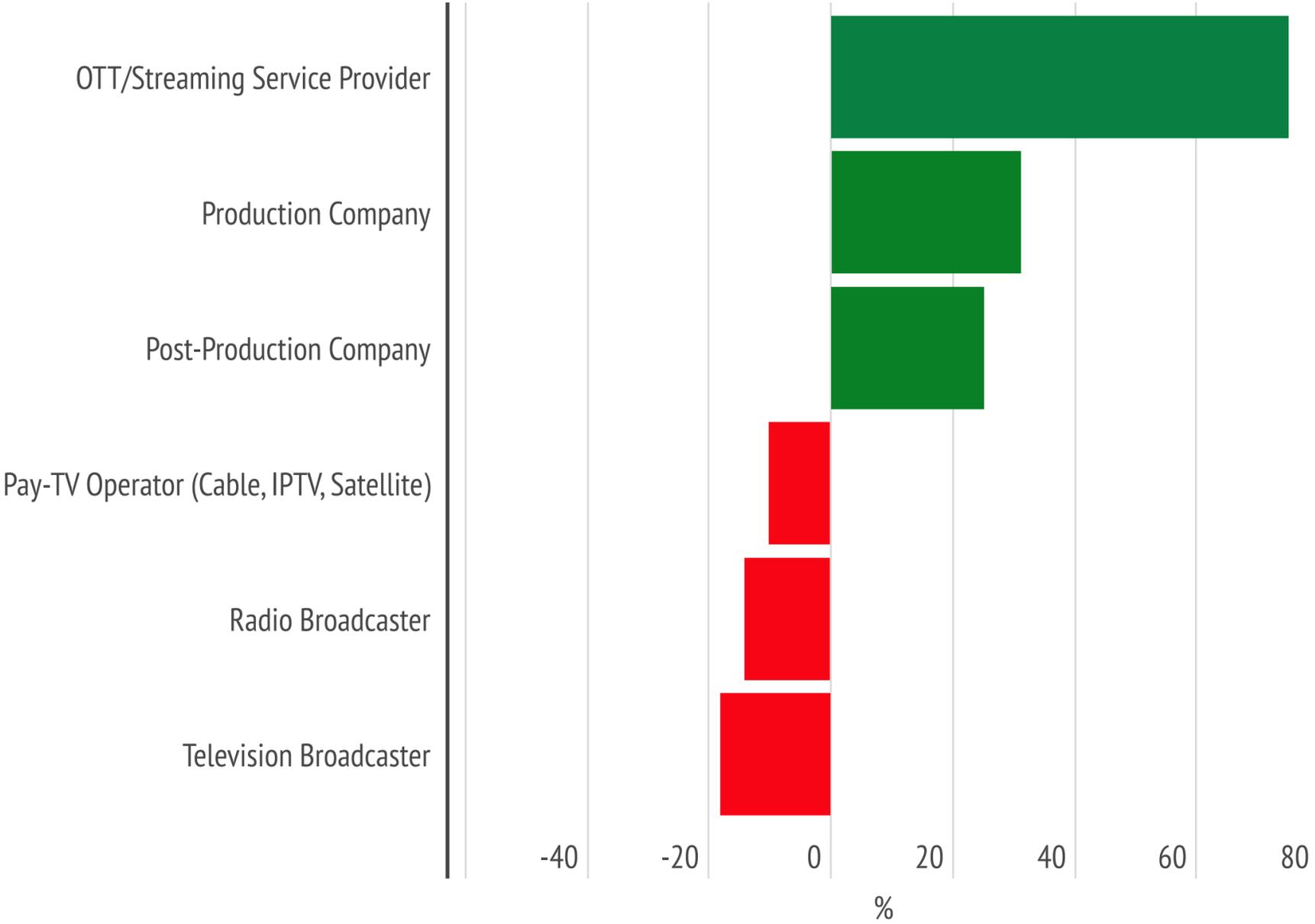


# Content Distribution & Monetization Tech Trends

## Pressure on legacy funding sources

According to IABM data, the COVID-19 pandemic accelerated digital polarization thanks to the content-led streaming boom. While OTT and Streaming Service Providers have a very positive revenue outlook, legacy technology buyers' revenue prospects continued to deteriorate in 2021. Particularly, legacy media businesses are facing an increasing pressure on legacy subscriptions and legacy ad models. The shift toward streaming and the decline in TV ratings are making traditional audience measurement methods like panel-based TV ratings (e.g., Nielsen) outdated, driving changes in advertising reporting.

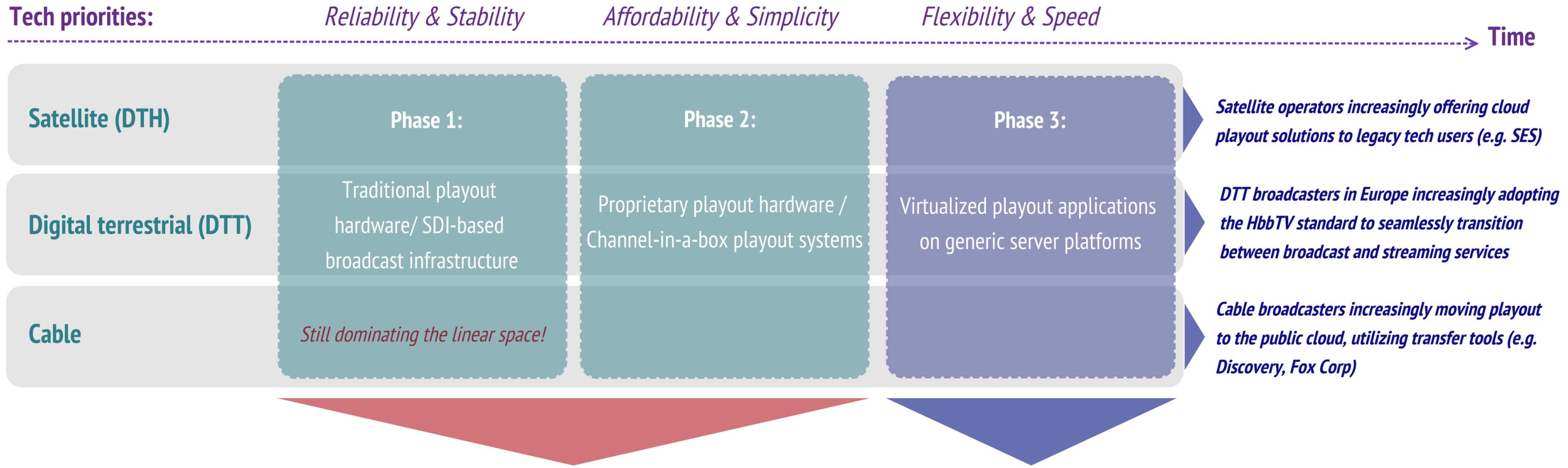
Revenue outlook, NET difference in revenue outlook





# Content Distribution & Monetization Tech Trends

## Legacy distribution systems - Linear playout



### Challenge:

The majority of existing hardware-based playout systems cannot be virtualized or it is very challenging and costly!

### Opportunity:

Cloud playout can coexist/ be integrated with traditional hardware-based infrastructure, allowing a gradual replacement of legacy architecture!

# Content Distribution & Monetization Tech Trends



## Linear Playout Systems - Satellite (DTH)

While Non-Linear Publishing and Internet Distribution are the fastest-growing investment categories in Publish, Linear Playout, Terrestrial Distribution, Satellite Distribution and Cable Distribution are nearly at the bottom in our ranking. However, as satellite remains a major distribution platform in several regions, large satellite operators have recently launched new cloud playout services, providing broadcasters flexibility and an affordable way to better manage their linear TV channels focusing on local in-country content. For example, broadcasters are able to prepare content for broadcast quickly, roll out (pop-up) channels and attract new audiences with targeted advertising regardless of their location as there is no more need for on-premise hardware. Media companies can gain significant cost-savings by leveraging virtualized hardware with cloud playout functions like archiving, playback, encoding and graphics. According to SES, as of June 2021, the company was already managing cloud playout for over 525 TV channels and delivering about 8,400 hours of online video streaming everyday, expecting its cloud revenue to jump from €3M in 2020 to €10-15M in 2021. In September 2021, SES announced that over 60 channels from Africa, Asia-Pacific and Europe combined had adopted its SES' Cloud Playout solution since Q1/2021. For instance, several broadcasters on Ethiosat - Ethiopia's first dedicated free-to-air TV platform - have adopted SES' Cloud Playout solution to respond faster to their viewers' increasing demand for local content.



# Content Distribution & Monetization Tech Trends

## Linear Playout Systems - Satellite (DTH)

*As pointed out by one SES' Ethiopian customer, Engidawork Gebeyehu at Yegna TV, "With [SES] cloud playout, we are able to respond to viewer demand and bring content to their homes faster and more flexibly than ever before via the cloud, meeting viewer demand for more local content. Using the cloud playout service also means that we are no longer restricted by hardware constraints and can get a channel ready for distribution much faster than before".*

Another increasingly important driver forcing satellite TV providers to speed up their adoption of cloud playout services relates to security. For example, an agreement with a cloud service provider - whose investment in security outweighs significantly that of an individual broadcaster - often requires that all content and operational modules are accessible with different passwords and stored in multiple locations. Hence, a potential ransomware attack can be avoided by moving to the unaffected system. The adoption of a cloud or virtualized playout system enables media companies to integrate many security products at the same time, making it convenient to purchase them once moving to cloud playout. This is in line with recent IABM data showing that cyber security has become a top priority for media companies over the past 12 months.



# Content Distribution & Monetization Tech Trends

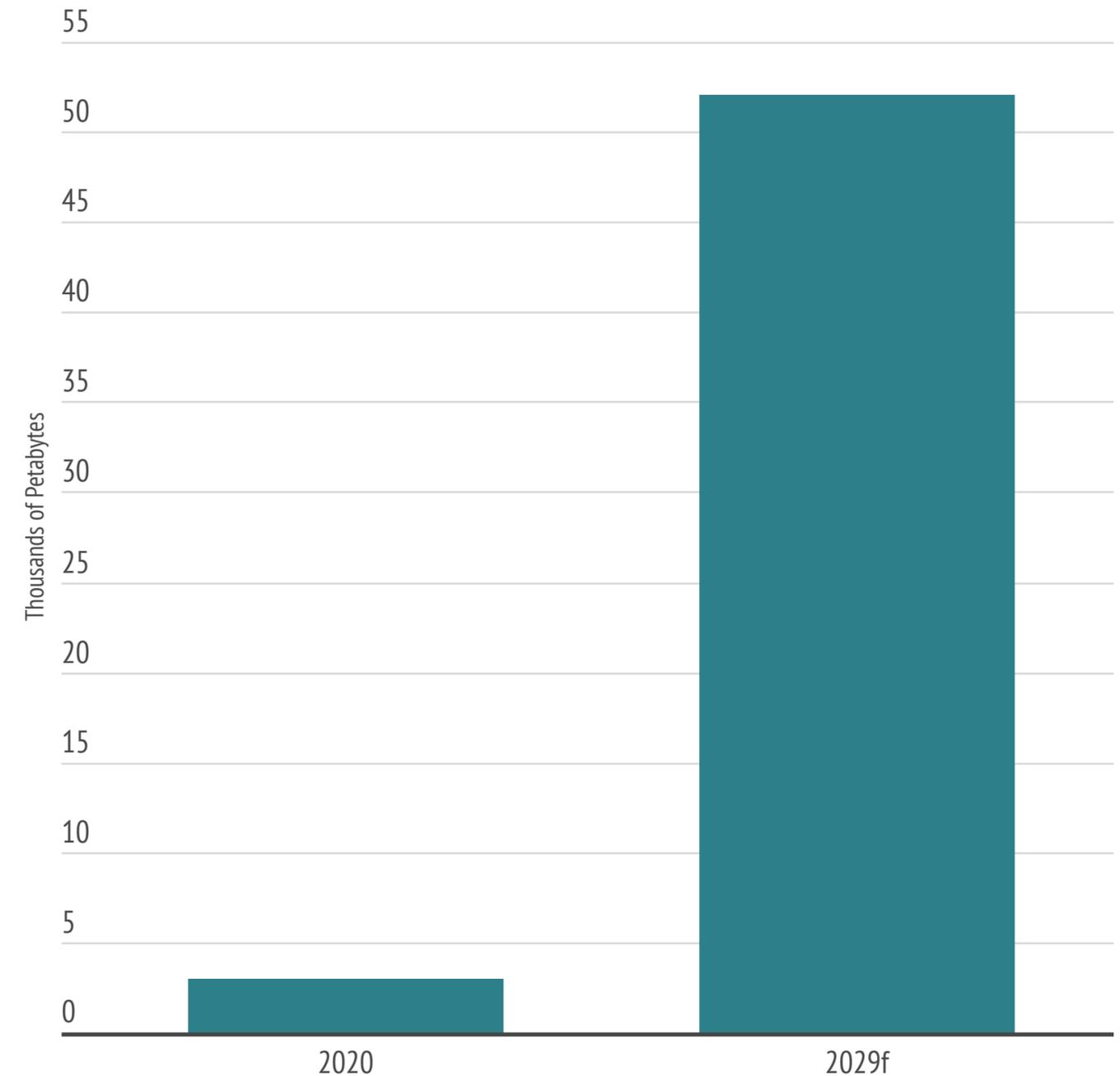
## Linear Playout Systems - Satellite (DTH)



*I talked about the developments we're making in **cloud playout** and online video platforms that augment what we do from a core infrastructure standpoint as well as HD+, which is a really important nugget within SES delivering significant revenue, but also **B2C** allowing us to **create value at the customer edge***

Steve Collar, CEO & President, SES (2021)

Cloud data traffic over satellite globally - Estimated



Sources: IABM, satellitetoday.com, broadbandtvnews.com, SES, Company Filings. Note: 1 petabyte = 1,000 terabytes



# Content Distribution & Monetization Tech Trends

## Linear Playout Systems - Terrestrial (DTT)

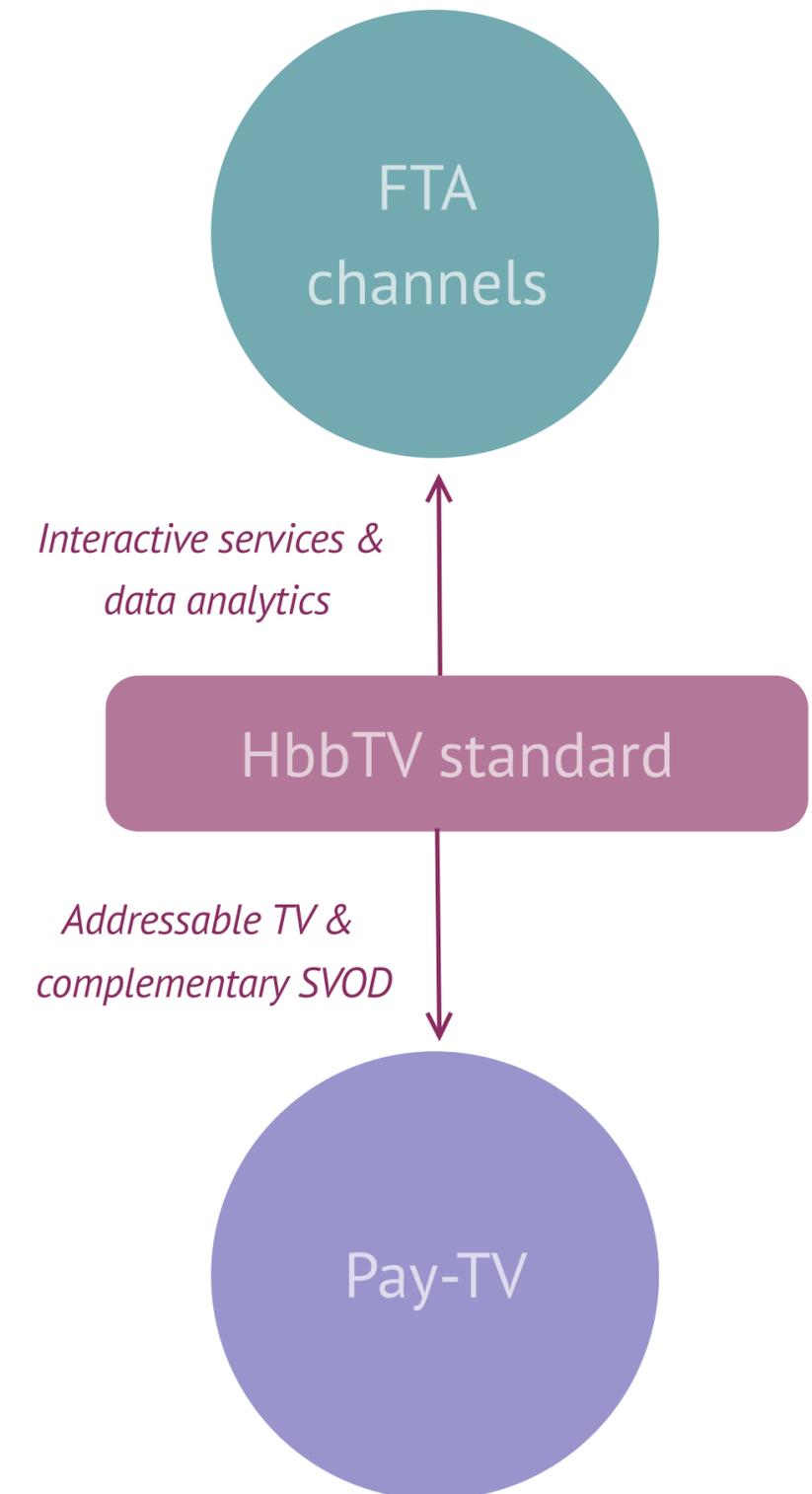
In the digital terrestrial television (DTT) environment, the rollout of 5G networks is driving change; in several countries, broadcasters are obliged to free up DTT spectrum to accommodate 5G, following government mandates. The loss of spectrum - leaving room for new competition from the streaming space - is pushing broadcasters to improve UX by offering better video and audio experiences on their existing channels as well as streaming services. However, as the migration to next-generation DTT standards (e.g., DVB-T2) and compression technology (e.g., HEVC) - which would enable broadcasters to double the number of their HD channels - is very slow and dependent on national governments and consumer device adoption, broadcasters are increasingly investing in short-term solutions that can optimize current DVB-T/MPEG-4 AVC spectrum efficiency. For example, AI/ML-based applications improving the AVC codec can save up to 20% of bandwidth compared to traditional encoding solutions, according to Harmonic. Another option in the short-term is to deliver more streaming services, complementary linear services and time-shift TV, reducing pressure on the spectrum for broadcasters. Thanks to advancements in low latency streaming technologies (i.e., HLS, DASH), broadcasters can now deliver broadcast and streaming services side-by-side without a noticeable delay between the two, when deploying the Hybrid broadcast broadband TV (HbbTV) standard. Most importantly, the HbbTV standard enables broadcasters to insert ads dynamically, improving and diversifying their monetization sources.



# Content Distribution & Monetization Tech Trends

## Linear Playout Systems - Terrestrial (DTT) & Pay-TV

HbbTV is an international initiative aimed at providing open standards for the delivery of advanced interactive TV services via broadband and broadcast networks to CTVs and set-top boxes. In many countries, broadcasters can already deliver targeted advertising on HbbTV-based connected TVs (i.e., Addressable TV) using the future DVB-TA standard. Some media companies - like Digita in Finland - have adopted a model, where they produce HbbTV platform services for other TV broadcasters. The advantage of HbbTV is that it can be used in different ways for FTA, Pay-TV and online streaming, while combining linear and online parts of TV business - mass delivery and personalized services. For example, when used in the context of FTA, HbbTV allows a broadcaster to deploy several engagement services such as voting in live programs, whereas a commercial broadcaster can use the same standard for adding interactive parts on linear advertising and get real-time data on ad campaigns. Moreover, Pay-TV operators can complement their linear Pay-TV services with SVOD services by using a HbbTV service platform creating direct links from linear programming to SVOD.



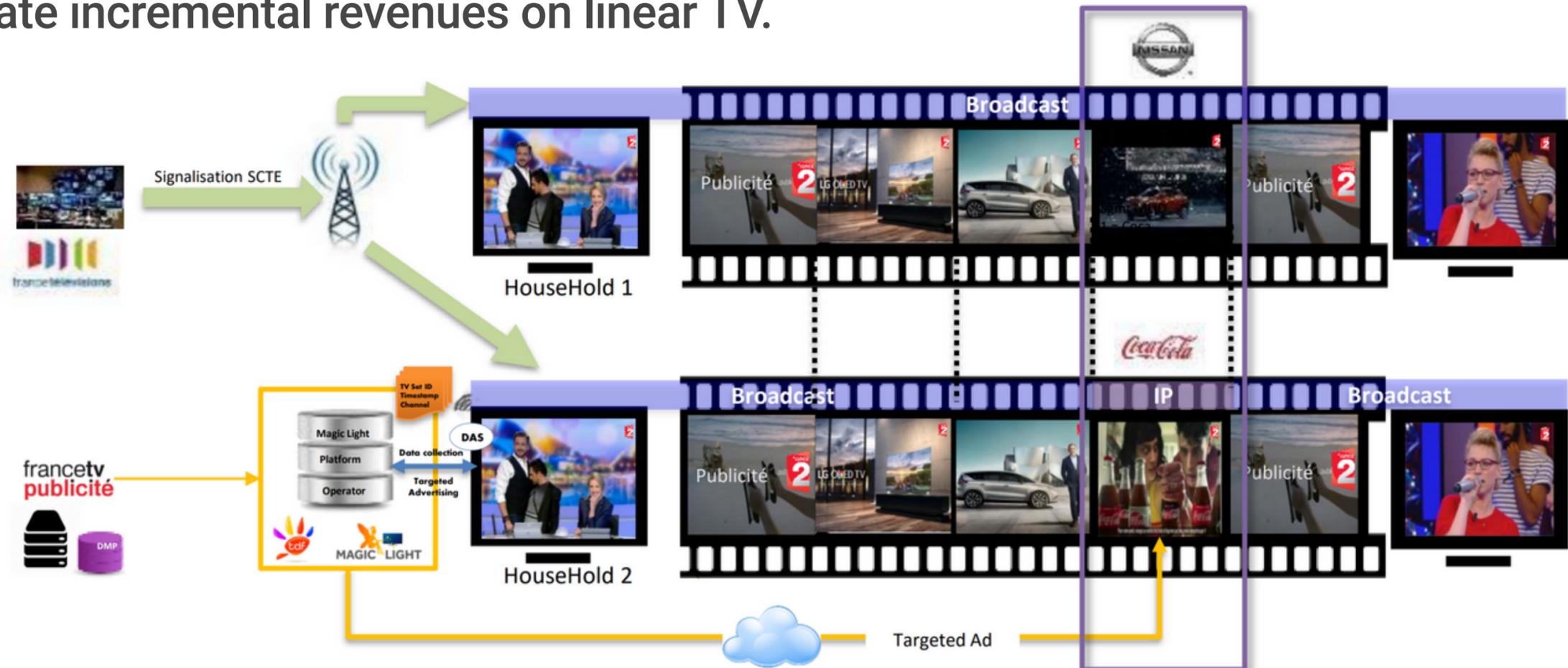


# Content Distribution & Monetization Tech Trends

## Linear Playout Systems - Terrestrial (DTT)

HbbTV technology enables broadcasters to see real-time viewership of their programming, helping them to optimize campaigns when they can see what ads are being watched by which device. The use of the HbbTV standard enables advertisers to use geo-targeting by region in a similar way as DMA (Designated Market Areas) targeting in US linear TV. The most common ad products enabled by HbbTV technology are called "SwitchIn" ads, which supplement the existing content on the screen by overlaying ads on top or wrapping them around it. This enables broadcasters to create incremental revenues on linear TV.

### HbbTV-based Dynamic Ad Substitution (DAS)





# Content Distribution & Monetization Tech Trends

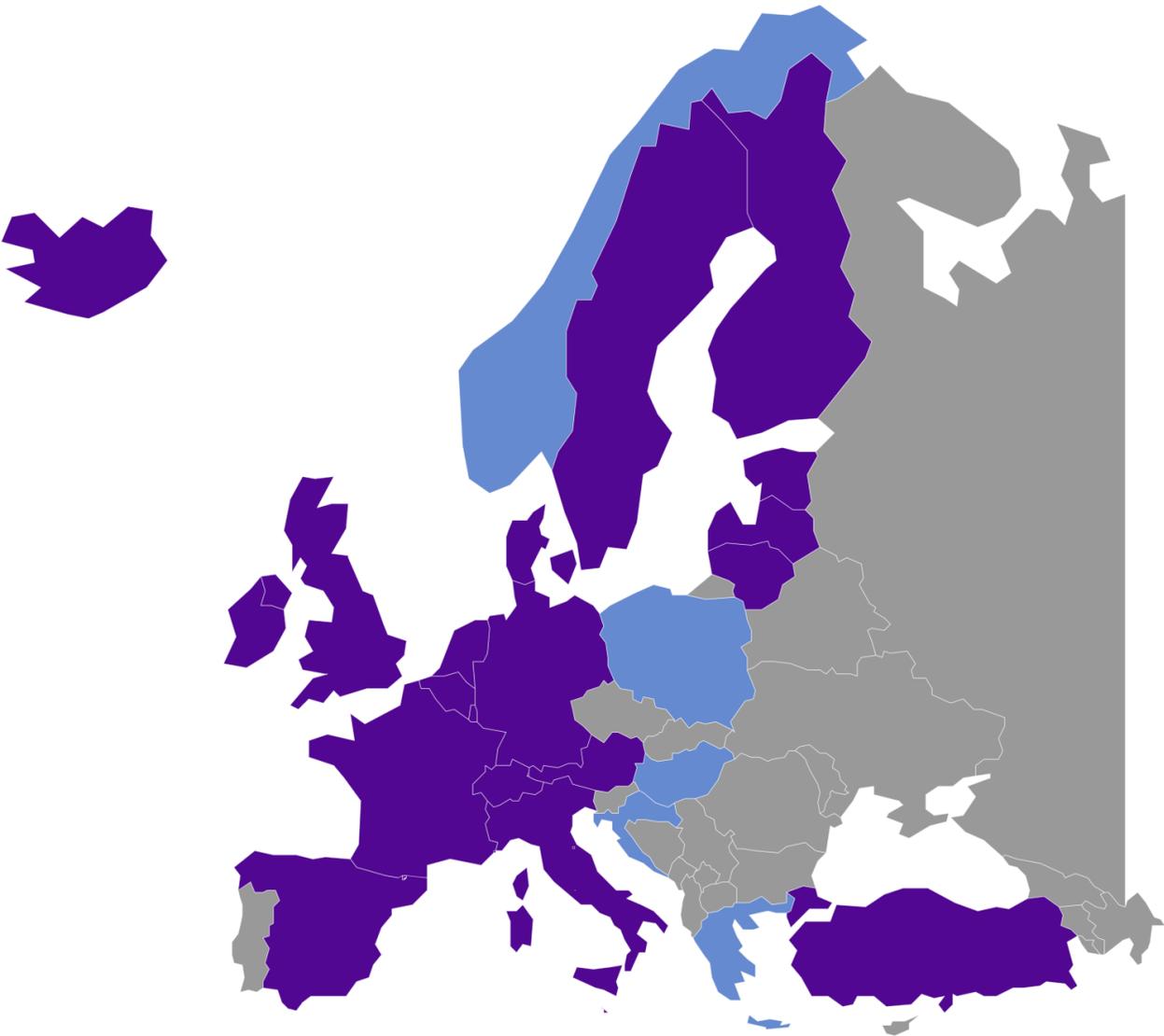
## Linear Playout Systems - Terrestrial (DTT) Hybrid TV

### HbbTV-based Addressable TV initiatives by country in Europe (2021)

Country	Digital Video Broadcast (DVB) TV	Managed TV Platforms	OTT TV
Austria	IP Austria/RTL Deutschland, Goldbach Austria, ProSiebenSat.1 PULS4	IPTV operators conducting initials trials	Independent OTT services launching ATV offerings (e.g. Zattoo)
Belgium	HbbTV not currently used for ATV advertising	SBS/DPG Media/Telenet, RTL/IP Belgium, RMB/Proximus	Early forms of ATV offerings in BVOD by RTLplay (RTL), VTM GO (DPG), GoPlay (SBS), Auvio (RTBF/RMB)
Croatia	Broadcasters conducting initial trials	IPTV operators conducting initial trials	Early forms of ATV offerings in BVOD
France	M6 pioneering in HbbTV-based ATV offerings, followed by France TV	M6, TF1, France TV cooperating with Orange and Bouygues, Canal+ cooperating with Bouygues	Early forms of ATV offerings in BVOD by 6play (M6), Molotov
Germany	All dominant commercial broadcasters providing Hbb-TV based ATV offerings	Sky AdSmart, Deutsche Telekom, Vodafone offering/developing IPTV-based ATV solutions	ATV offerings available in BVOD by RTL+ (RTL Deutschland), Joyn (ProSiebenSat.1 and Discovery), Zattoo, waipu.tv
Hungary	Broadcasters conducting trials	IPTV operators conducting trials	Early forms of ATV offerings in BVOD by RTL Most and TV2 Group
Italy	Mediaset, Sky Media, Discovery, Sportitalia, MediaPason, Citta Celeste, PRS Mediagroup, LaCTV providing HbbTV-based ATV offerings	IPTV not used for ATV advertising	Early forms of ATV offerings in BVOD by Rai Play, Mediaset Play, Discovery Plus, Eurosport Player, Sportitalia, LaCTV
Netherlands	HbbTV not currently used for ATV advertising	IPTV not used for ATV advertising	Early forms of ATV offerings in BVOD by RTLXL (RTL Nederland), Videoland (RTL Nederland), KIJK (Talpa Network)
Nordics	Finnish broadcasters conducting initial trials	IPTV operators conducting initial trials	ATV offerings available via OTT services of major broadcasters in Denmark (TV2) and Sweden (TV4)
Poland	Broadcasters conducting trials	IPTV operators conducting initial trials	Early forms of ATV offerings in BVOD by TVP VOD and TVN Player
	Atresmedia, Discovery, Mediaset Espana, Pulca, RTVE		Early forms of ATV offerings in BVOD by

### Addressable TV ad tech usage in Europe (2021)

● No ATV advancements yet
 ● Commercial ATV solutions in place
 ● Initial ATV tests



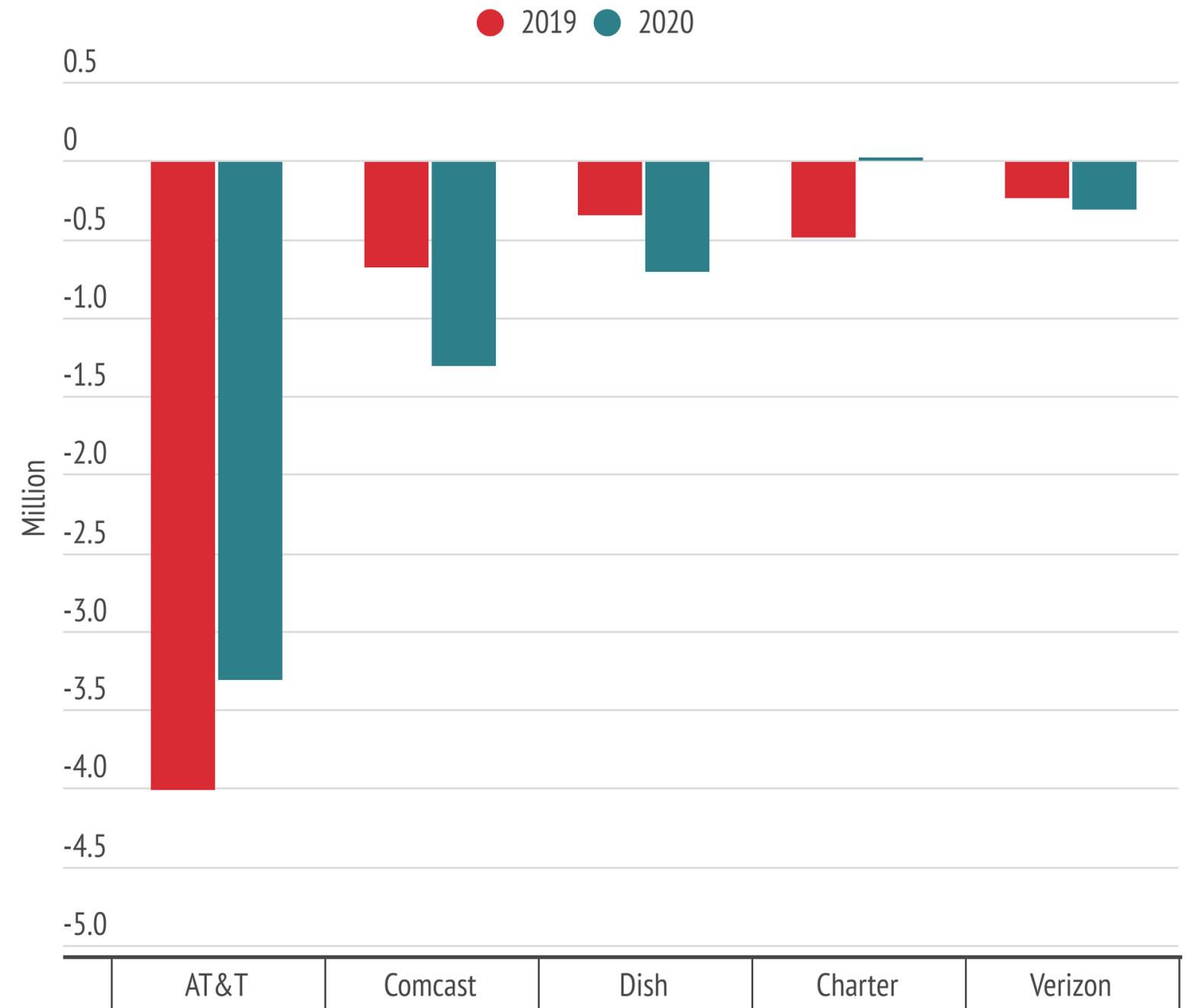


# Content Distribution & Monetization Tech Trends

## Linear Playout Systems - Cable distribution

The COVID-19 pandemic has accelerated the speed at which American TV households are cancelling their cable TV subscriptions; whereas in 2019 cable TV subscriptions saw a 15% decline, the figure is expected to drop by 27% in 2021, according to data from The Trade Desk. The US' largest cable TV services providers like AT&T (#1) and Comcast (#2) continued to lose cable TV subscribers in 2021, while their streaming services are attracting new subscribers quickly. Hence, the focus of their tech investments is shifting to cloud computing and internet distribution, while news and sports remain as the last differentiating assets of their linear bundles.

Cord cutting by Pay-TV provider in the US





# Content Distribution & Monetization Tech Trends

## Linear Playout Systems - Cable distribution

Many cable TV service providers are investing in cable head-end solutions to support the service generation workflow for both broadcast and OTT delivery. Unified or converged head-ends combine hardware and software, enabling cable TV companies to ensure high-quality content delivery across all screens and equipment involved in the service generation workflow, which typically includes playout, encoders, transcoders, multiplexers, a packager, storage servers, switchers, modulators etc. For example, Harmonic's cloud native CableOS solution - a virtualized access network platform for both hybrid fiber/coax (HFC) and fiber-to-the-premises (FTTP) - enables its customers to use the same technology for OTT and broadcast service delivery. By Q4/2020, CableOS was deployed commercially by 44 customers, delivering an increase of 91% YoY in sales for the product. For instance, Comcast started using CableOS in 2019, followed by Vodafone in 2020. In December 2021, Canada's largest cable operator, Rogers Communications announced that it would invest over US\$145 million to extend services over FTTP, using Harmonic's CableOS platform. Comcast, in turn, is rumoured to be exploring a strategy to license its virtualized Converged Cable Access Platform (vCCAP) technology, which is partly based on Harmonic's CableOS platform.

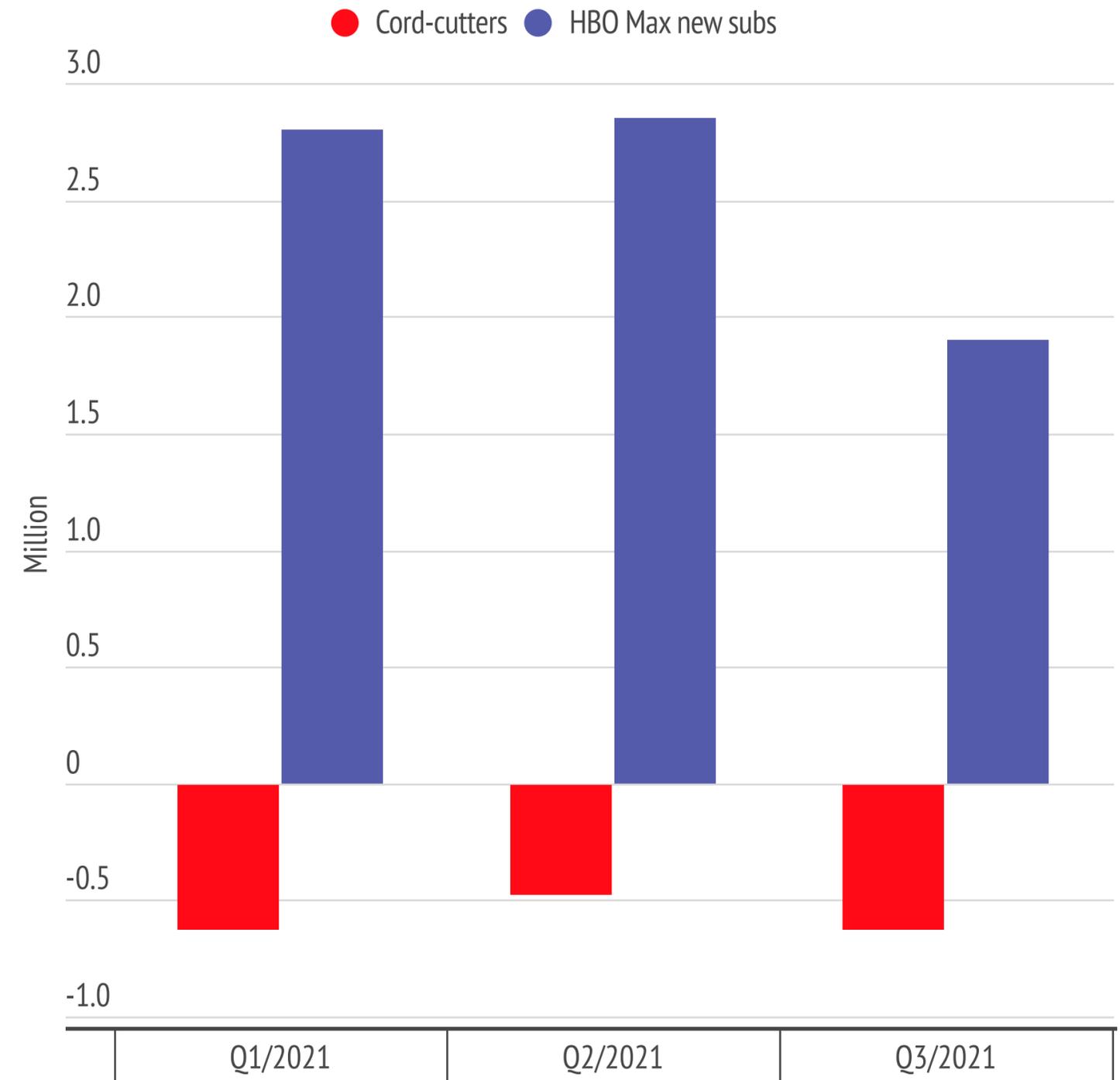


# Content Distribution & Monetization Tech Trends

## Linear Playout Services - Pay-TV + SVOD

As the major Pay-TV operators continue to launch OTT services loaded with both their back catalogues and a range of exclusive content, all entertainment content will soon be available via connected TV, shifting viewership to new platforms at the expense of linear Pay-TV consumption. As a result, some Pay-TV operators have recently launched their own smart TV sets and moved toward super aggregation by onboarding SVODs to their own platforms, bringing together studio content and thematic channels with OTT services. For example, Sky launched Sky Glass smart TV in October 2021, combining its own exclusive content with originals from the biggest streaming players and other UK broadcasters.

AT&T cord cutters vs. HBO Max new subs



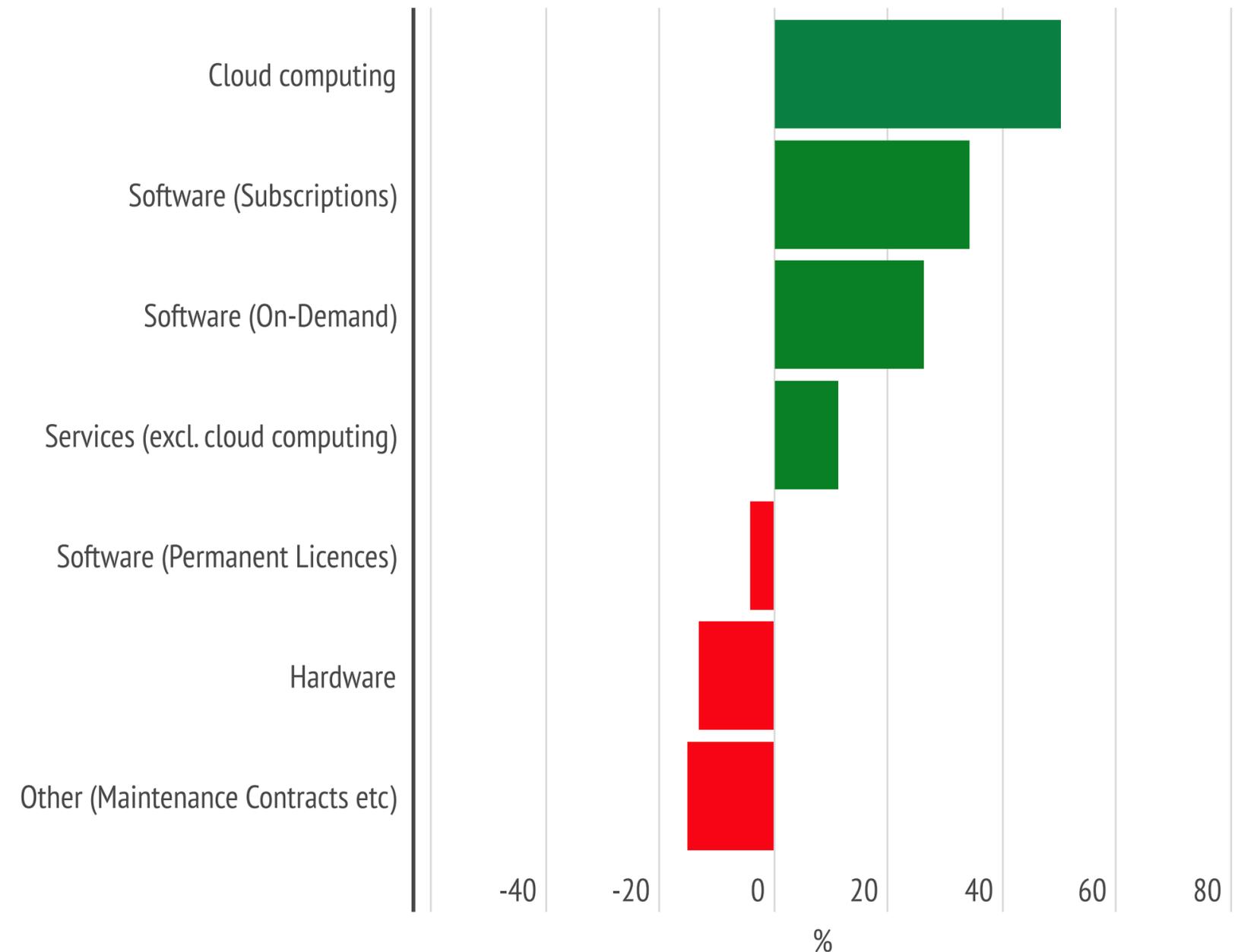


# Content Distribution & Monetization Tech Trends

## Non-Linear Publishing Services - Cloud-based VOD & OTT

As highlighted by IABM data, media companies see cloud computing and software for subscriptions and on-demand as their most important investment areas. While some big programmers like Discovery moved their operations to the cloud several years ago, the COVID-19 pandemic has pushed media companies to speed up their migrations to the cloud. Over the past few years, the biggest public cloud service providers like AWS have launched their own media-specific offerings, dedicated to different distribution platforms. In the US, the adoption of ATSC 3.0 - or NextGen TV - is incentivizing broadcasters to move their operations to the cloud, as many key features of NextGen TV will require more flexibility and agility.

Media tech investment outlook, NET difference in investment





# Content Distribution & Monetization Tech Trends

## Non-Linear Publishing Services - Cloud TV & hosted OTT video platforms

The COVID-19 pandemic accelerated subscription stacking and the fragmentation of viewing, as consumers tried new services (and liked them). With the streaming space getting more crowded, broadcasters are speeding up their move to OTT and Software-as-a-Service (SaaS) business models, spurred on by cloud computing. Accordingly, many broadcasters are investing in hosted, cloud-based OTT video platforms offering ready-made tools for uploading, managing, monetizing and securing content. For example, the Kaltura TV platform enables its customers - including Viacom18 and YLE - to boost engagement and interactivity with personalized multi-screen access to linear, VOD and time-shifted TV as well as third-party content. In February 2021, Vodafone - which has deployed the Kaltura TV platform since 2014 to support its telco-grade TV service in multiple countries - launched its Vodafone TV service in Germany using Kaltura's platform.



*Pay-TV providers everywhere are recognizing the advantages of **cloud TV** as the optimal engine for offering Over-The-Top (OTT) services as part of a **super-aggregation strategy**, and the best way to reach audiences wherever they are*

Nuno Sanches, GM of Media and Telecom, Kaltura



# Content Distribution & Monetization Tech Trends

## Non-Linear Publishing Services - Cloud TV & hosted OTT video platforms

Another OTT video provider, Brightcove, has recently launched a new marketplace that enables media companies to search and discover new video technology integrations from Brightcove's partners. For example, customers using Brightcove's OTT video platform can now take advantage of OTT revenue intelligence platform Watching That as well as monetization and subscriber management platform inPlayer. As the role of consumer data and data analytics have become the key in D2C business, such hosted OTT video platforms backed with an extensive tech partner ecosystem offer broadcasters a fast way to upgrade and adopt new streaming capabilities.

Earlier in 2021, Brightcove launched a new cloud playout feature to enhance its Brightcove Video Cloud to help content owners to quickly program a scheduled playout of both on-demand video and live content into a single stream. This means that its customers - like AMC - can now deliver broadcast-grade "live TV" experiences that leverages recorded content to improve viewer engagement and monetization.



# Content Distribution & Monetization Tech Trends

## Internet Distribution - CDNs

The content-led streaming boom caused by the COVID-19 pandemic resulted in an explosive growth in internet traffic, which - since then - has remained at a high level, as viewers and gamers have continued to use the services they tried during the pandemic. The massive jump in day-to-day traffic - driven by online video and gaming - has benefitted CDNs and related service providers, whose revenues have grown at double-digit rates. CDN business - being correlated with the continued growth of streaming services - is also booming thanks to the biggest streaming players like Disney+ that continue to enter new markets and introduce new local content. Hence, in those regions where the biggest streaming giants are expanding their presence, CDN providers are also seeing rapid growth.

More traditional media companies are also investing in CDN services, which help them to bridge their linear business with digital operations. In 2019, Harmonic launched its CDN-enabled Primary Distribution solution, which manages the delivery of linear channels from programmers to Pay-TV operators, local broadcasters or virtual MVPDs around the world via CDNs. Based on Harmonic's VOS360 SaaS platform, programmers using the solution can aggregate channels, manage content rights and distribute OTT-ready channels from the cloud to distribution partners worldwide.



## Internet Distribution - CDNs

Another important driver for media companies to buy services from CDNs relates to security - CDNs can filter bad traffic from clean traffic and protect content from Denial of Service (DDoS) attacks. For example, Edward J. McGowan, CFO at Akamai highlighted in Nasdaq 44th Virtual Investor Conference in June 2021 that *"over 60% of our customers today buy one security product. We have roughly 30% or so that are buying more than one security product. There are customers that buy security only. Think of the IT security. You don't have to be a CDN customer to leverage our enterprise security products or our mobile security products. But generally speaking, the two go hand-in-hand in terms of web security. A lot of times, as you're doing the delivery, you're doing the security at the same time"*.

Along with rising competition in the crowded SVOD space, user experience (UX) and fast time to market have become the most important differentiators for media companies. CDNs play a central role in helping streaming service platforms in providing a flawless UX through content caching (i.e., storing content at the closest points to the end-users) and CDNs' multiple points of presence (i.e., serving content to the user from the nearest server), which reduce latency. Moreover, CDNs help broadcasters to manage unpredictable traffic spikes - and hence the UX, translating into better viewer engagement and retention.

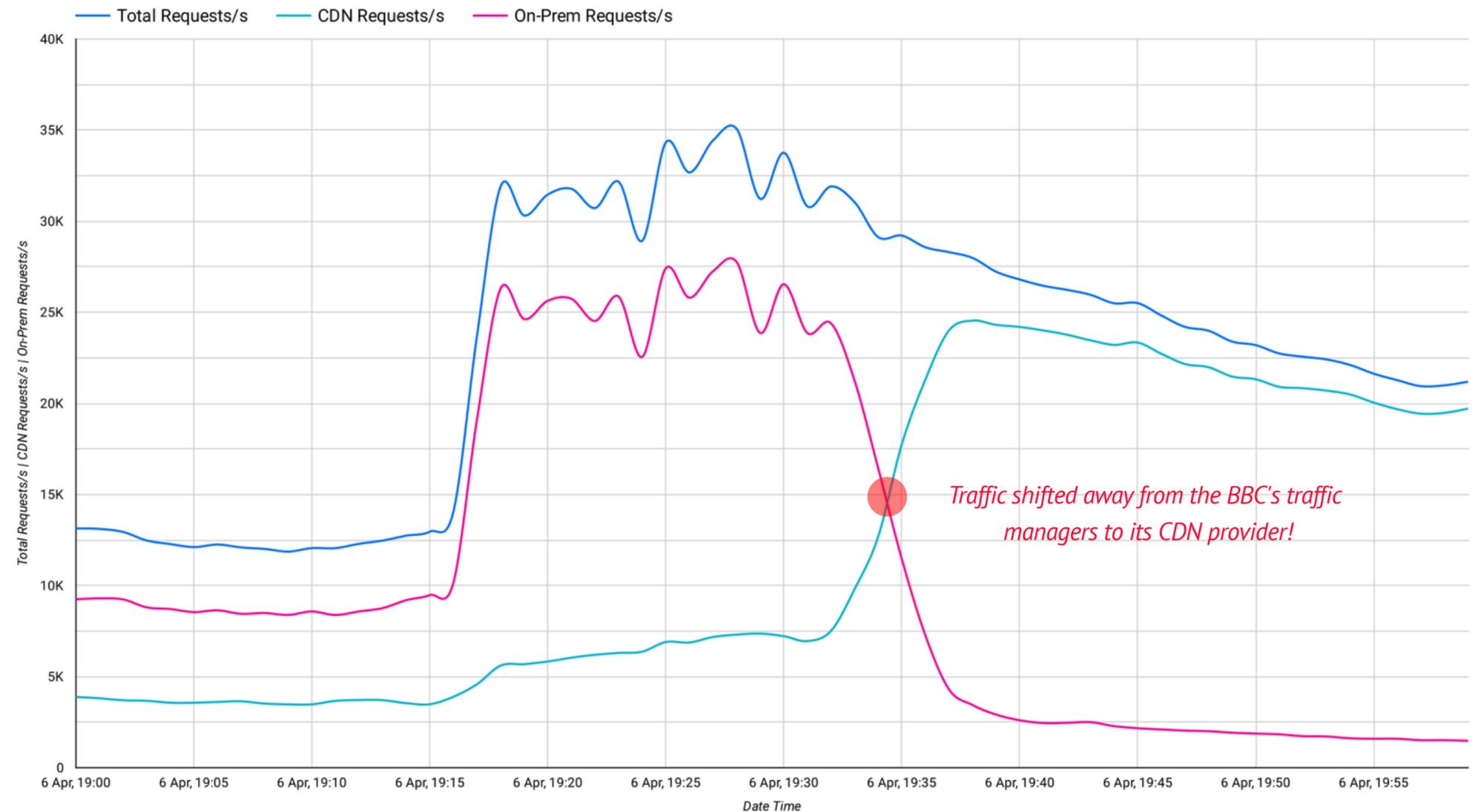


# Content Distribution & Monetization Tech Trends

## Internet Distribution - CDNs

For example, at times of high traffic, a broadcaster can make a switchover from its own traffic managers to a CDN provider - without interrupting the traffic flow. In April 2020, the BBC had to deploy an emergency change of traffic to their CDN provider after having received a sustained period (~20 minutes) of high traffic load due to the breaking news announcement about Boris Johnson being in intensive care with a COVID-19 infection. By shifting traffic to its CDN provider, the BBC avoided harming the UX of its viewers.

BBC's Requests Per Second per route during traffic spike on Apr 6th 2020



Traffic shifted away from the BBC's traffic managers to its CDN provider!



# Content Distribution & Monetization Tech Trends

## Rights Management - DRM

The content-led streaming boom caused by the COVID-19 pandemic pushed many content producers to premiere their movies online, incentivizing content piracy. According to IABM data, trends such as cross-border illegal access to content and security breaches leading to content leakages were identified as those whose importance had accelerated due to the COVID-19 pandemic. Our data shows that most media businesses are focused on addressing content protection from a business or consumer perspective, acting on areas such as quality of media experiences and personalization. This is in line with media businesses' focus on direct-to-consumer platforms and hangs on the assumption that consumers will not seek illegal content consumption if provided with a seamless media experience at an acceptable price. Our data shows that one of the possible threats to this approach was identified in fragmentation (of both technical support and content rights) which constitutes a potential obstacle for consumers wanting to access content from different sources at an appropriate price. Accordingly, most media companies and OTT players are investing in DRM solutions. According to IABM research, most DRM users prefer multi-DRM and multi-key solutions, primarily relying on Fairplay, followed by PlayReady and Widevine.



# Content Distribution & Monetization Tech Trends

## Advertising Systems - From linear to digital advertising

Even though linear TV ad inventory still receives the large majority of the money committed to the annual linear upfront ad market, streaming has started to dictate the deal-making process. As broadcasters' TV ratings become volatile and their linear ad inventory smaller, advertisers are moving money to streaming inventory to reach their ad campaign goals. In fact, this is also in the interests of TV networks, because the more volatile ratings are, the harder it is to predict and fulfil their upfront ad commitments. Hence, TV networks are increasingly capping the amount of money going to a show's linear airing (i.e., linear TV inventory) to incentivize advertisers to redirect a bigger share of their ad budgets to the show's streaming distribution, leaving broadcasters room for last-minute - and more expensive - premium "scatter" deals for linear ad inventory. "Scatter" market refers to air time, which is sold - at a higher price - closer to the actual programming date and which is not necessarily targeted to a particular demographic audience. In the US, many TV networks trying to make more money by prioritizing scatter deals, from which they received extra money can be used to compensate their former ad campaign debts. According to McKinsey, underdelivery of ad inventory has become so severe that media companies have started to pay advertisers back for unfulfilled commitments instead of providing free ad space in consecutive quarters.

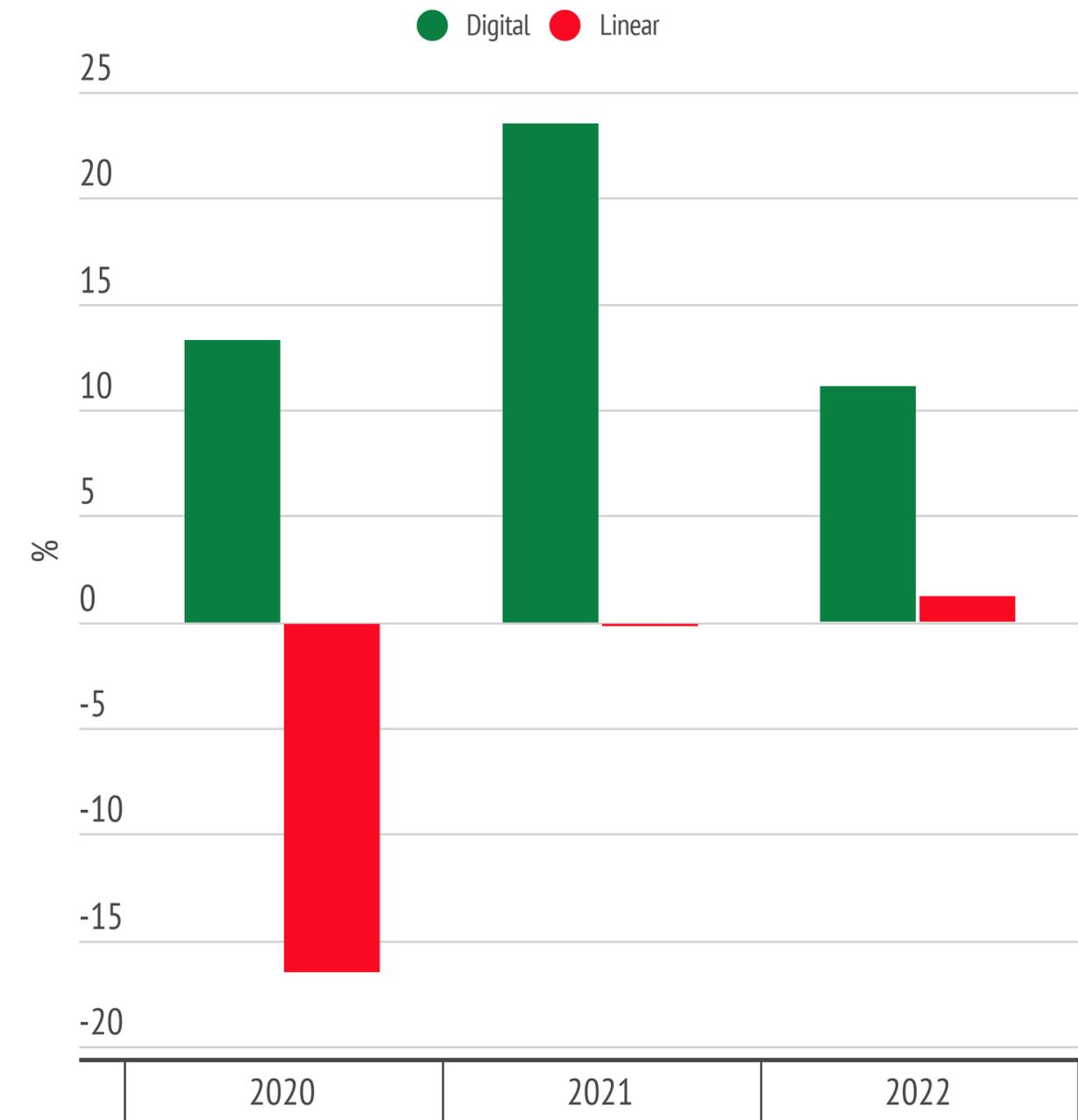


# Content Distribution & Monetization Tech Trends

## Advertising Systems - From linear to digital advertising

Spending on digital upfront ad deals - particularly for connected TVs - has been growing at double-digit rates since 2020. The shift away from upfront linear ad deals toward streaming ad inventory is opening up ad money to a wider range of ad sellers like connected TV platform owners and major streaming services, offering more flexibility to advertisers than linear TV arrangements, which have rigid cancellation options (e.g., 60 days). New digital-only ad sellers like Roku are attracting advertisers with very flexible cancellation options (e.g., 2 days). Some streaming ad sellers such as YouTube are offering so called "endeavor" deals, which allow an advertiser to take advantage of pricing discounts after having spent a certain amount of additional money on a campaign. Broadcasters are increasingly responding to this new competition from streaming-only ad sellers by adopting similar flexible terms and deal types.

Net advertising revenue growth by medium in the US

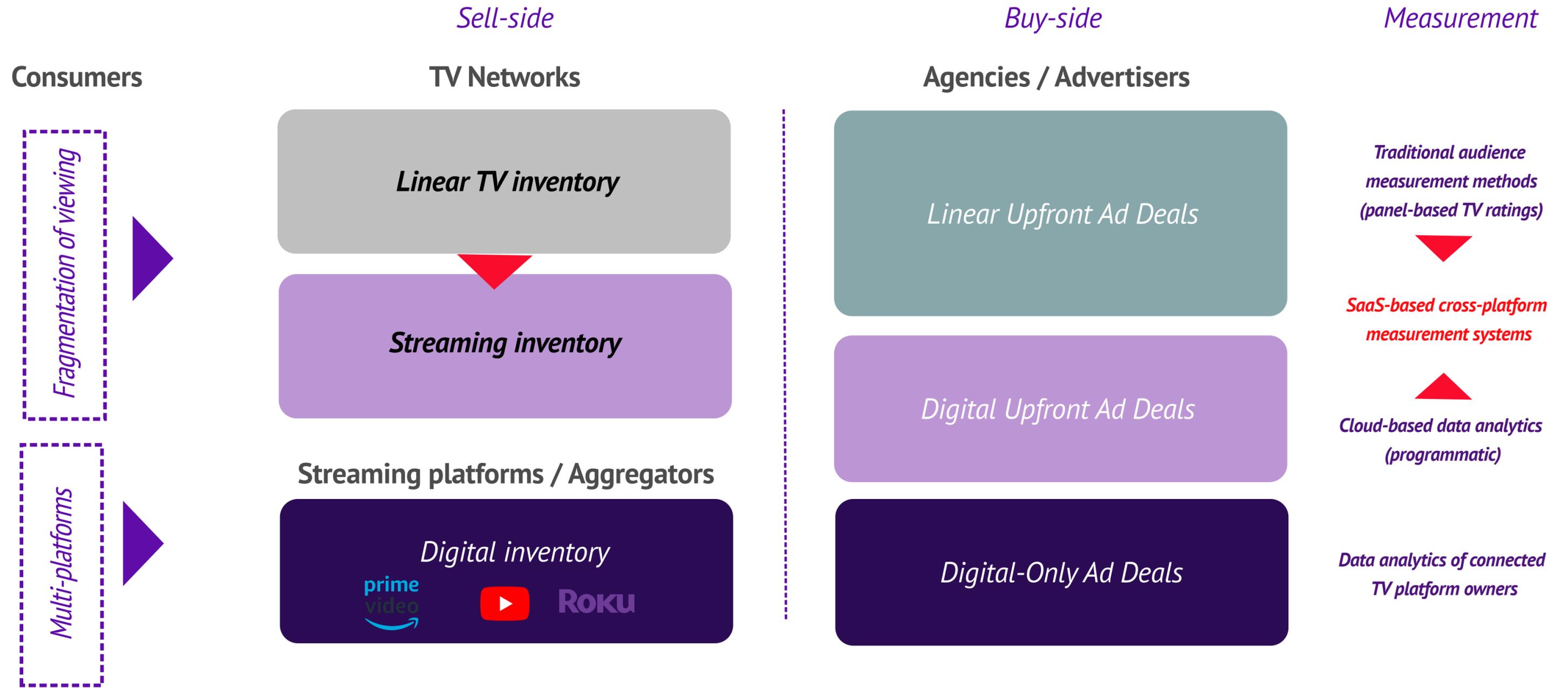


Sources: IABM, Omnicom Media Group, digiday.com, Magna (figures for 2021 and 2022 are projections)



# Content Distribution & Monetization Tech Trends

## Advertising Systems - Diversification of video inventory



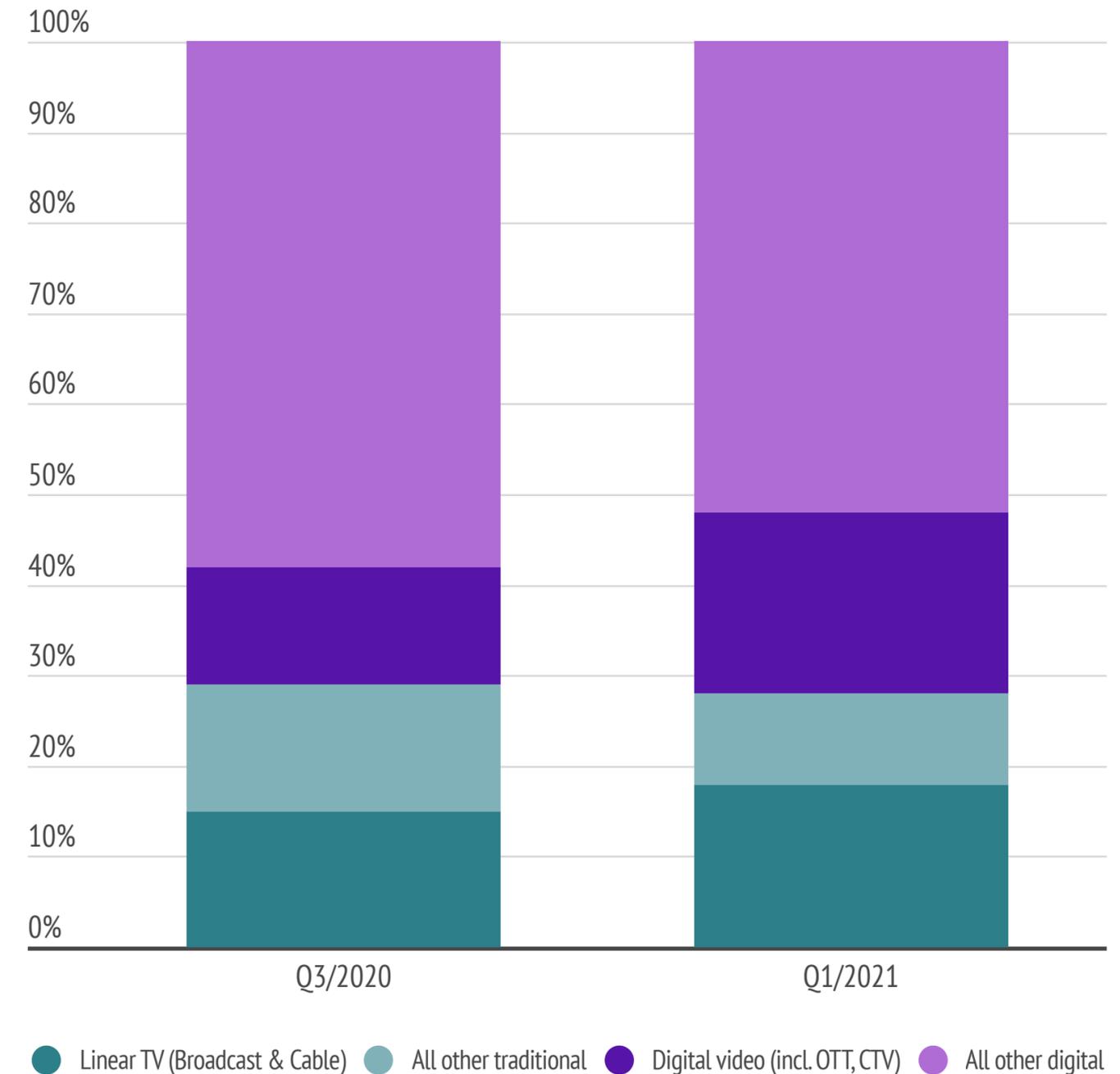


# Content Distribution & Monetization Tech Trends

## Advertising Systems - Programmatic advertising

In digital, programmatic advertising already accounts for the large majority of ad buying, mainly focusing on streaming services and premium VOD sold across digital video channels and connected TVs. Sell-side companies like Sky, Comcast, Hulu, RTL and Channel 4 are investing in programmatic platforms and marketplaces designed for advertisers and agencies, who can programmatically purchase video ads running on their platforms. These platforms (e.g. NBCUniversal's One Platform) simplify and standardize the process of buying TV ad campaigns across different ad inventory pools. As linear viewership continues to shrink, TV networks are trying to attract smaller business to buy very low-cost, targeted TV campaigns by investing in similar self-service ad platforms to those digital-only players are using.

Net advertising revenue growth by medium in the US





# Content Distribution & Monetization Tech Trends

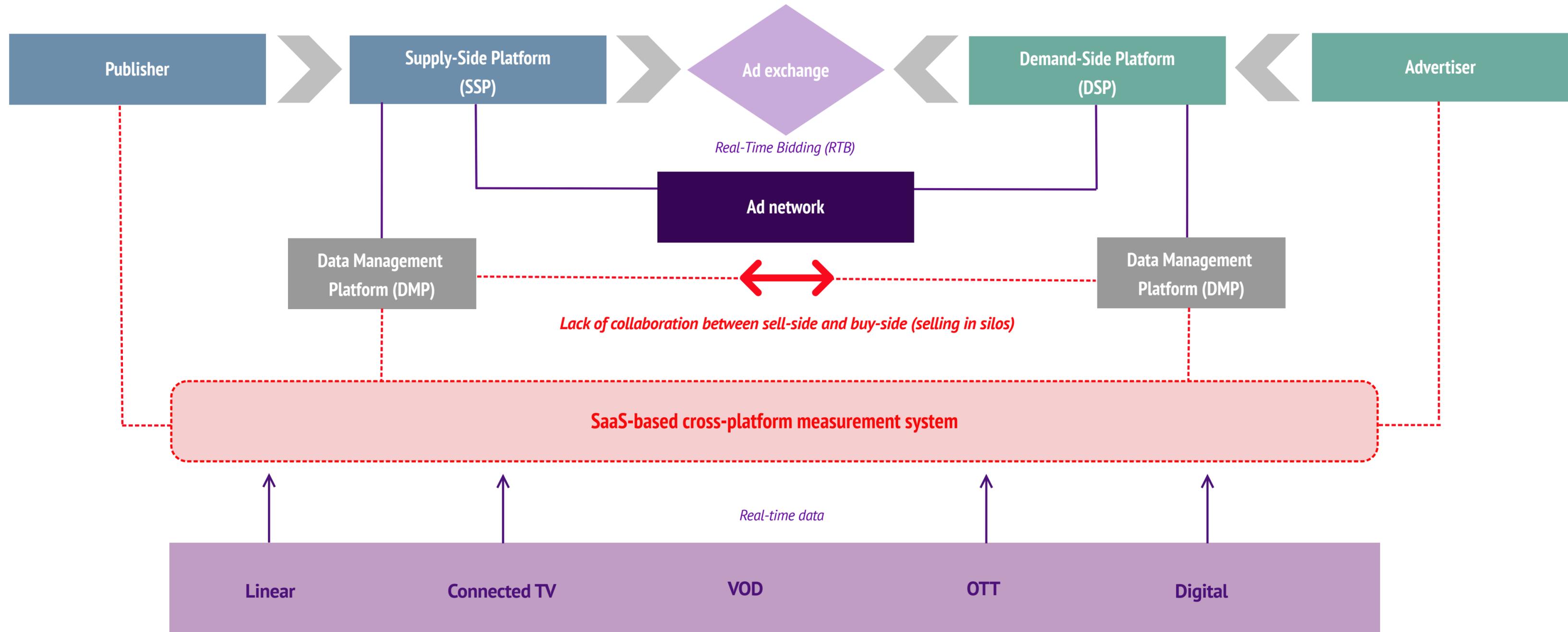
## Advertising Systems - SaaS-based cross-platform measurement systems

Over the past five years, media companies like Comcast, AT&T, Sky and RTL Group have improved their programmatic capabilities by acquiring ad technology platforms and service providers. However, many of these acquisitions focused on either sell-side (i.e., Supply-Side Platforms, SSPs) or buy-side (i.e., Demand-Side Platforms, DSPs) technology used in the ad marketplace. Or, the acquired companies were providers of Data Management Platforms (DMPs) seamlessly connected with SSPs and DSPs. While publishers use DMPs to personalize and optimize content, advertisers collect audience data and optimize campaigns through DMPs. Recently, the diversification of ad inventory and the shift from upfront linear ad deals to streaming have not only made traditional audience measurement systems (e.g., Nielsen) antiquated, but also revealed the lack of collaboration between sell-side and buy-side platforms - ad selling is still happening in silos. Therefore, media companies - moving their operations to the cloud - are now investing in SaaS-based cross-platform measurement systems and developing marketplaces automating workflows and decisioning across the buy and sell sides of the market. These platforms unify media companies' own user data with advertisers' datasets, improving personalization and targeting of ads. By investing in cross-platform measurement systems, media companies can attract new advertisers, who can improve their efficiency and cross-platform campaign management.



# Content Distribution & Monetization Tech Trends

## Advertising Systems - SaaS-based cross-platform measurement systems





# Content Distribution & Monetization Tech Trends

## Advertising Systems - SaaS-based cross-platform measurement systems

While media companies are developing their own cross-platform measurement systems, they are also expanding their technology partner ecosystem to aggregate more ad tech capabilities on their programmatic marketplaces. Some sell-side publishers (i.e., broadcasters or media companies) are developing their new SaaS-based ad marketplaces to be "leased" or offered to other media companies or streaming players. This strategic approach enables a media company to increase its digital revenues from two sources: digital advertisers and other media businesses using their cross-platform ad trading and measurement system. For example, in 2014, Comcast acquired Freewheel, an ad tech firm specialized in programmatic/targeted advertising unifying linear and digital TV ad trade. In 2020, Freewheel - now a Comcast Company - acquired Beeswax, a Software as a service (SaaS) company offering programmatic ad capabilities through its Bidder-as-a-Service (BaaS) customizable bidding stack. The acquisition enables FreeWheel users to access a broader pool of inventory and better address connected TV (CTV) and Set-top-Box Video on Demand (STB VOD) segments. In October 2021, FreeWheel announced that it is partnering with RedBox, a streaming company offering AVOD and free, ad-supported streaming television (FAST) services. The partnership will allow Redbox to take advantage of FreeWheel's programmatic marketplace, letting advertisers, DSPs and buy-side platforms have an easier access to Redbox's inventory.



# Content Distribution & Monetization Tech Trends

## Advertising Systems - SaaS-based cross-platform measurement systems

Moving to cross-platform measurement and trading platforms has the advantage that running cross-platform campaigns on CTV/OTT improves addressability and audience reach, when ads can be delivered on a 1:1 basis. This means that platform owners are able to control ad frequency at the user-level, which is not possible in the linear world. Broadcasters are also embracing cross-platform trading to increase their Broadcast Video on Demand (BVOD) offerings, which grew in popularity during the COVID-19 pandemic. BVOD refers to content created by conventional broadcast media, which is subsequently made available on-demand and online, delivered on a 1:1 basis.



*"BVOD services are still **works-in-progress**, but we're making a lot of progress quickly. At ITV, we're building out our **new marketplace** to support **programmatic trading** and custom audience targeting, using both our own registered user data and advertisers' own datasets. We're creating a common TV identity solution and a marketplace for data to provide greater agility for both incumbent and prospective clients"*

Rhys McLachlan, Director Of Advanced Advertising, ITV





# Content Distribution & Monetization Tech Trends

## Subscription & CRM Systems - Churn management

The COVID-19 pandemic accelerated demand for ad-supported streaming, as viewers tried new services and switched to a mix of premium, paid and free services. While ad-free paid subscription platforms (e.g., Netflix) remain dominant in the market, ad-supported streaming services are winning market share as cable TV networks continue to attract viewers outside the Pay-TV bundle. Media companies are taking advantage of one-to-one ad delivery via internet distribution, which enables accurate price segmentation thanks to data on consumers' willingness to pay. New segmentation strategies with two price points - one ad-free and one ad-supported - attract especially more price sensitive, younger viewers. For example, since June 2021, HBO Max is available as an ad-free option priced US\$14.99 per month or with ads at US\$9.99. To attract new subscribers for their new ad-supported streaming options, broadcasters are developing shorter, less invasive and and less repetitive ad types (e.g., "pause ads", "branded discovery ads" etc). Also, media companies are keeping ad loads of ad-supported streaming services low (typically 40%-80% of the linear average) to minimize churn. In terms of the top SVOD services, the overall subscriber numbers remain stable, even though subscription stacking is increasing. Moreover, viewers are increasingly "shopping" single, specific pieces of content (e.g., one movie, one episode) among SVOD services' libraries and then cancelling their subscriptions for some time until the next must-see piece of content comes out ("churn and return").



# Content Distribution & Monetization Tech Trends

## Super Aggregation

Over the past six months, several media companies have moved toward super aggregation and launched their own smart TVs and streaming devices. For example, Sky launched its own smart TV, Sky Glass in October 2021, providing its subscribers access to a collection of top streaming services like Netflix, Amazon Prime, Disney+ as well as content from other UK broadcasters like the BBC, ITV and Channel 4. Amazon also launched its first branded TV sets - Amazon Fire TV Omni and Amazon Fire TV 4 - in October 2021. These initiatives show how the living room has become the key contact point with viewers, because those content providers who control the device-based data analytics, also control the whole UX/UI - and the whole media supply chain. Accordingly, broadcasters and Pay-TV operators are coming together to create bundled SVOD services, which add value through their combined brands. For example, the BBC and ITV are partnering around Britbox and the FreeWheel app, uniting all the UK's terrestrial broadcasters on iOS and Android. Many Pay-TV operators are onboarding SVODs to their platforms to provide viewers the convenience of content all in one place. By onboarding new, smaller SVODs, Pay-TV operators can extend their content libraries while offering a large audience for these SVOD newcomers in exchange. Super aggregators are attracting viewers with direct billing options to control payment terms, margins and viewer data. Such "hard" bundling, where subscribers only pay for the SVOD service through their aggregator, is becoming increasingly popular.



# Content Distribution & Monetization Tech Trends

## Super Aggregation and UI/UX

While Pay-TV operators are curating SVOD bouquets - with partner apps on their platforms, they need to invest in automation and ability to integrate external services quickly to provide a smooth UX/UI. However, this is very costly and challenging, because content partners (i.e., SVODs) are reluctant to share their data - the central asset in their revenue creation - with the aggregator. Hence, controlling UI/UX can be very challenging for the aggregator, when viewers have to sign in to different services multiple times, because its content partners want viewers to use their apps, where they can advertise their content and gather their own viewing data to convince advertisers to choose their channels.

To improve UX/UI, super aggregators are investing in cloud-based, unified search and discovery capabilities as well as choosing public cloud to shorten their time to market - a key differentiator among super aggregators. Accordingly, many aggregators - after having moved to the cloud - are prioritizing the unification of their content supply chain, offering a scalable, hyper personalized single entertainment hub as a service. Investing in hybrid monetization enables aggregators to lower churn and secure their profitability. The cloud also enables aggregators to improve adaptability, when automating and orchestrating their workflows.