Perspectives from the Global Entertainment & Media Outlook 2018–2022

Trending now: convergence, connections and trust

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About this report

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Welcome to this year's special report on the findings of our *Global Entertainment & Media Outlook*. Every year we take a deep dive into the data and analysis that our team of researchers and industry specialists have unearthed – with the aim of providing fresh perspectives and actionable insights.

Our comprehensive data and projections on the 15 defined segments across 53 territories are just the start in creating these insights. As in previous years, our authors have blended the data with their own observations, experiences and examples to turn raw information into true intelligence.

What's trending now? It's clear we're in a rapidly evolving media ecosystem that's experiencing Convergence 3.0 – a new and different wave of convergence driven by different capabilities and higher expectations, and manifesting itself simultaneously in multiple dimensions.

In Convergence 3.0, the dynamics of competition are evolving while a cohort of ever-expanding supercompetitors and more focussed players strive to build relevance at the right scale. And business models are being reinvented so all players can tap into new revenue streams, by, for example, targeting fans and connecting more effectively with customers to develop a membership mind-set.

The pace of change isn't going to let up anytime soon. New and emerging technologies such as artificial intelligence and augmented reality will continue to redefine the battleground. In an era when faith in many industries is at an historically low ebb and regulators are targeting media businesses' use of data, the ability to build and sustain consumer trust is becoming a vital differentiator.

The result? To succeed in the future that's taking shape, companies must reenvision every aspect of what they do and how they do it. It's about having, or having access to, the right technology and excellent content, which is delivered in a cost-effective manner to an engaged audience that trusts the brand. For those able to execute successfully, the opportunities are legion.

Writing this report was an exciting and energising experience – and we hope these qualities shine through. To learn more about how our findings and perspectives apply to your business, please contact your local PwC team (see page 32) or reach out to either of us. We look forward to hearing from you.

Best regards,

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Introduction: a new wave of convergence

Convergence is all the rage again across entertainment and media (E&M), technology and telecommunications. The thick borders that once separated these industries – and sectors within them – are dissolving. Large access providers and platform companies are integrating vertically, while established giants are integrating horizontally. Companies that once offered only technology and distribution are moving into content. The distinctions between print and digital, video games and sports, wireless and fixed Internet access, pay-TV and over-the-top (OTT), social and traditional media are blurring. Although they all had different starting points, many companies in this converged entertainment ecosystem are now aiming at business models that revolve around direct-to-consumer relationships. The transformation unfolding before our eyes is enabling this vast global industry to keep growing at a pace close to its historical rate – even amid significant disruption (*see Exhibit 1*).

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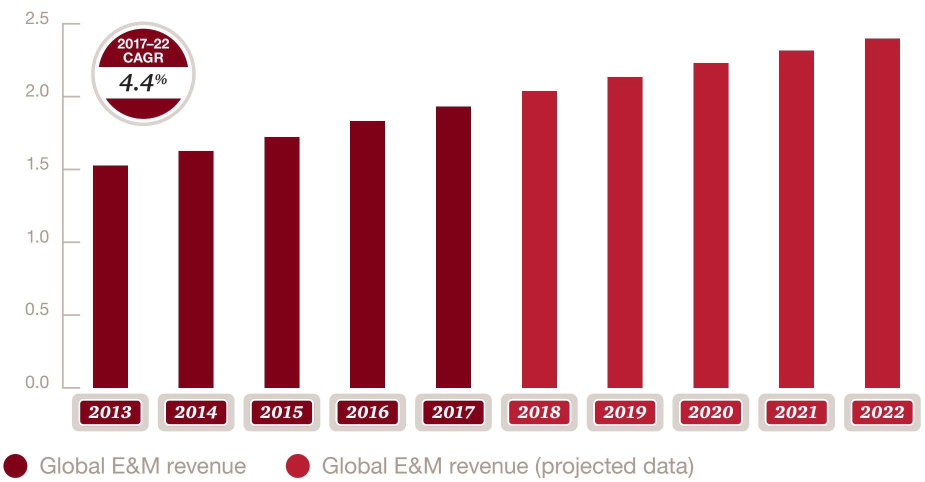
Of course, convergence has been cited – and hyped – before. But this time it's different. To explain why, we'll start with a brief history of the convergence seen to date in the industry.

The first wave of convergence (let's call it Convergence 1.0) occurred between 1999 and 2003. Hailed as heralding a new paradigm in E&M, this convergence had at its core a series of deals involving traditional content businesses and delivery-focussed or distribution-focussed players whose combination could accelerate growth and value-capture across converging media platforms. Broadcaster CBS merged with Viacom, a pay-TV network company. Telecommunications provider Telefónica bought Endemol, a global television production company and creator of *Big Brother*. News Corporation added DirecTV, a US-based satellite operator then owned by Hughes Electronics, to its global portfolio of video-distribution assets. And in the biggest media deal of all time, Internet portal AOL merged with media conglomerate Time Warner.

Exhibit 1: Global E&M revenue (US$ tn)

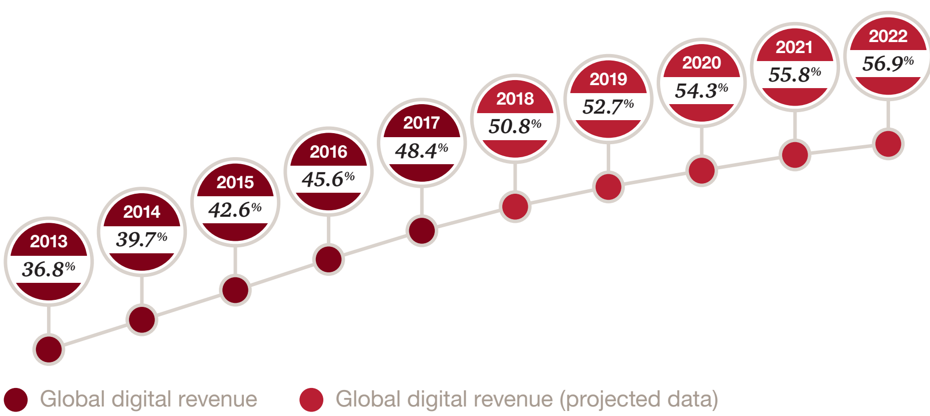
Growth rates remain steady even as the industry is being transformed.



Source: PwC Global Entertainment & Media Outlook 2018–2022, www.pwc.com/outlook

Exhibit 2: Global digital revenue as % of total revenue

Digital revenues will continue to make up more and more of the industry's income.



Source: PwC Global Entertainment & Media Outlook 2018–2022, www.pwc.com/outlook

At the time, it was believed that each deal would produce transformative benefits in terms of enhanced consumer reach, new distribution and technology capabilities and increased organisational scale and efficiency. However, highly optimistic projections for strategic and operational synergies were generally not met for a variety of reasons, including mismatches in culture, insufficient cross-business collaboration, breakdowns in strategic planning and deal execution and premature market timing. And in each of these examples, the deals were eventually unwound.

Driven by concerns about slowing growth in core operations in a post-recession environment, the second wave of convergence – Convergence 2.0 – was less ambitious, deemphasising enterprise-wide transformation in favour of more measured vertical and horizontal integration. Rather than viewing deals as an aspirational route to create entirely new businesses, companies aimed their efforts at owning more links of the value chain and gaining scale. CBS purchased CNET in 2008 to bolster its digital content and advertising portfolio. In 2009, Disney acquired Marvel Entertainment, which had a complementary set of content and character businesses. In 2011, Comcast, primarily a cable operator, acquired NBCUniversal, which owned cable and broadcast networks, TV and film production operations and theme parks. Hearst in 2011 acquired 100 magazines from French media outfit Lagardère, seeking to increase its global reach. These transactions were, by and large, successful, even if they didn't dramatically reposition the combined companies in terms of new capabilities.

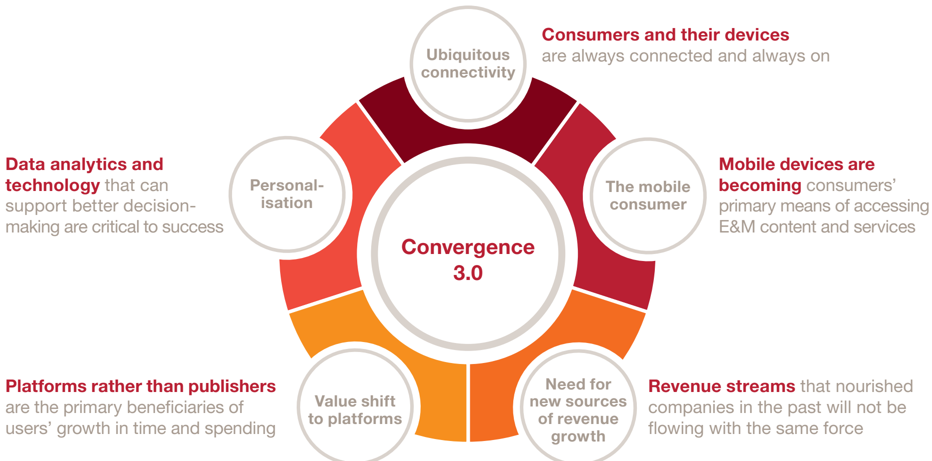
Convergence 3.0

We are now in the midst of a third wave of convergence. It is driven by a set of imperatives and trends fundamentally different from the prior two. In essence, the revolutions that began to reshape the E&M industries in the 1990s and 2000s have gathered critical mass and are now in control. Technology and communications companies have become permanent players in the E&M ecosystem. Furthermore, each of the trends below, in its own right, places pressure on players (and creates opportunities) to diversify revenue streams, position themselves in more and different points in the value chain and seek relevant scale. Taken together, they exert an irresistible force. The digital economy is several orders of magnitude greater in size and scope than it was a decade ago, and digital spending is projected to gain market share rapidly (*see Exhibit 2*).

Convergence 3.0 is starting from different core capabilities, business models, geographies, consumer behaviours and consumer expectations compared with the prior waves.

Exhibit 3: Five fundamental drivers of change

A handful of factors combine to create a new style of convergence.



Source: PwC

Drivers of change

We see five fundamental drivers of change (*see Exhibit 3*):

- ***Ubiquitous connectivity:*** ongoing investments in technology and broadband network infrastructure have expanded coverage, capacity, bandwidth and connectivity to the point where consumers and their devices are always connected and always on. These developments support an ever-expanding supply and diversity of content, experiences and applications that can be delivered directly and digitally to users.

- ***The mobile consumer:*** as spending grows, the connected mobile device is rapidly becoming consumers' primary means of accessing E&M content and services across virtually all markets worldwide. That makes it imperative for content creators, distributors and platforms to develop the means to reach and monetise mobile consumers directly through mobile experiences rather than through traditional sales and distribution approaches.

- ***Need for new sources of revenue growth:*** many sectors of the E&M ecosystem are showing weak, stagnant or even declining growth. Whether it is newspaper companies in the UK, movie theatre operators in the US, publishers in Japan or magazine companies around the world, players will find that the streams that nourished them in previous years will not be flowing with the same force. Simultaneously, telecommunications companies face stagnant core businesses and are looking at E&M as a growth driver of new products, services and experiences. Every company in the E&M ecosystem is racing to develop new revenue streams, especially in digital (*see Exhibit 4*).

- ***Value shift to platforms:*** as entertainment and media have digitised, social media and technology platforms, and not publishers (content creators and packagers), have often been the primary beneficiaries of users' growth in time and spending. The platforms have shown greater effectiveness in monetising across advertising, subscriptions and transactions. These platforms are playing a more prominent role in content creation. In parallel, many publishers, especially in video, are investing in their own platforms and seeking to become more proficient in technology, data and digital delivery.

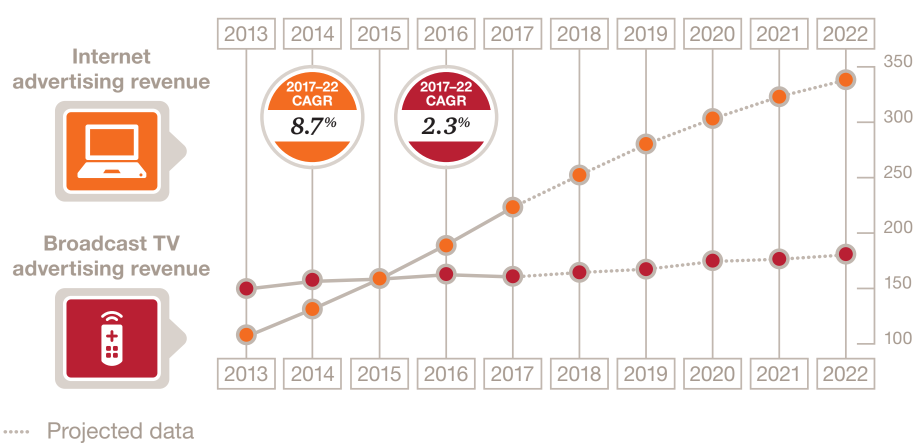
- ***Personalisation:*** consumers no longer want one-size-fits-all E&M experiences determined by network programmers or publishing editors. Neither do advertisers. As a result, data analytics and technology that can support better decision-making with respect to content, distribution, user experience and monetisation have become increasingly critical to success in the E&M marketplace.

These drivers mean that Convergence 3.0 is starting from different core capabilities, business models, geographies, consumer behaviours and consumer expectations compared with the prior waves. The effects of this third wave are likely to last longer and be more constructive, especially given the maturity and continued growth of digital markets. The result is that many players, regardless of their heritage of core competencies, will have to compete in several realms at once: content, access, distribution, global footprint expansion, technology, user experience, customer intimacy and monetisation.

In fact, we're already seeing some of the participants from prior waves take a more sophisticated approach towards convergence. In February 2018, Telefónica announced that its Movistar+ pay-TV unit would distribute 12 original Spanish-language series to 13 countries in Europe and Latin America through a new channel, Movistar Series. In addition to Telefónica's own original programming such as *La Peste*, a hit historical crime drama set in 16th-century Spain amid the outbreak of the bubonic plague, the channel will distribute movies, shows and documentaries created by third parties. And the 110m Movistar mobile phone customers will have access to the content as well.

Exhibit 4: Global Internet advertising vs. broadcast TV advertising revenue (US$ bn)

Sectors such as TV advertising will need to find new sources of revenue to offset stagnant growth.



Source: PwC Global Entertainment & Media Outlook 2018–2022, www.pwc.com/outlook

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Varieties of convergence

As the *Global E&M Outlook* highlights, the biggest technology and telecommunications firms are now acquiring and integrating E&M assets at a faster pace and a larger scale than ever before. According to PwC's *TMT Deals Insights*, the number of media and telecom deals rose 29% in 2017, to 876. But we are seeing participants of all sizes, and in all geographies, engage in strategic efforts that in prior eras would have been classified as vertical integration, horizontal integration or diversification. The reason is that media, technology and telecommunications enterprises now view it as an imperative to own the user experience. What's more, technology and telecom players are keenly aware that content has the potential to be a high-engagement, high-frequency, high-usage application that keeps users across all demographics and devices engaged and enables the provider to build relationships with them.

The specific business objectives being targeted vary from company to company: for Amazon, it's e-commerce, cloud services and, increasingly, advertising; for Apple, it's devices; for a telecom company, it's premium connectivity and related services (including subscriptions), as well as advertising. In every case, the underlying aim is to have a direct end-user relationship that enables the monetisation of engagement and loyalty in a variety of ways.

These activities translate into four varieties of convergence: convergence in media; convergence in access; convergence in business models; and convergence in geographies.

Convergence in media

Convergence is taking place within the media segment itself, as providers and distributors link up with one another in unprecedented and unexpected ways. Indeed, the distinctions among varieties of media are collapsing: an investigative series by a newspaper is now likely to include video, audio and text, all published in a digital format; additionally, distinctions are blurring between a video series made by a studio (Lionsgate), a pay-TV network (TNT, AMC or HBO), or a video streaming company (Netflix, Amazon or Hulu).

Video streaming services, TV networks, telecoms and social media platforms are all competing simultaneously over live sports rights. Recent examples include BT's purchase of media rights to English Premier League football, Amazon's streaming coverage of NFL Thursday Night Football games in the US and Facebook airing 25 Major League Baseball games exclusively on its platform. Twitter has live-streamed the Melbourne Cup, Australia's most prestigious horse race, and Time Warner recently acquired video rights to the UEFA Champions League to support the launch of B/R (Bleacher Report) Live, its new sports-focussed video streaming service.

Similar convergence is evident in other highly competitive spaces. We're seeing TV networks, telecoms, tech companies, OTT services and movie studios compete to provide a broad array of video content to consumers. Radio stations, podcast companies and music streaming services are battling it out to deliver on-demand audio content to users (*see Exhibit 5*). And Google, Clear Channel and advertising technology players are competing to provide digital out-of-home services.

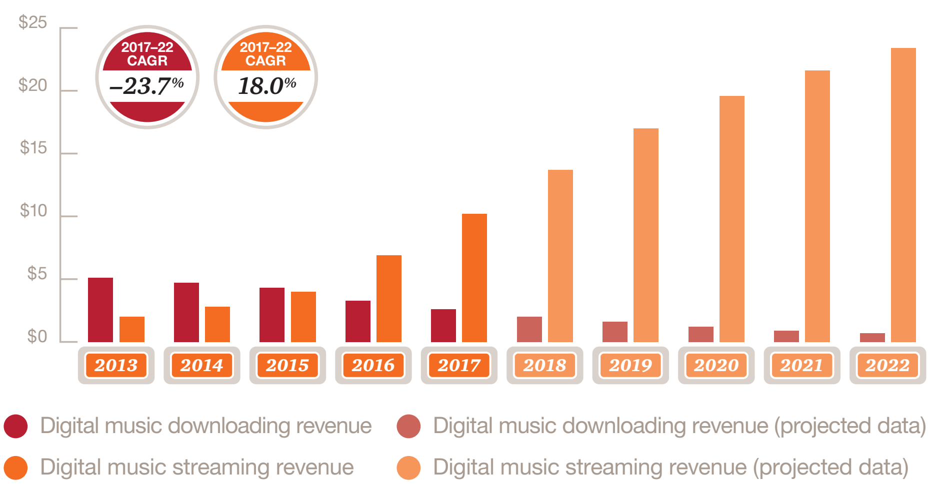
The distinctions among varieties of media are collapsing: an investigative series by a newspaper is now likely to include video, audio and text, all published in a digital format.

Convergence in access (wireless/fixed)

Convergence is also under way in the telecommunications industry as it prepares for mass rollout of high-bandwidth 5G services. Simply put, as consumers expect constant connectivity, the old classifications of wired, wireless, cable and satellite will become meaningless. Multiple system operators (MSOs, cable and satellite TV companies) are launching wireless plays. Telecoms are buying satellite and

Exhibit 5: Global digital music downloading revenue vs. digital music streaming revenue (US$ bn)

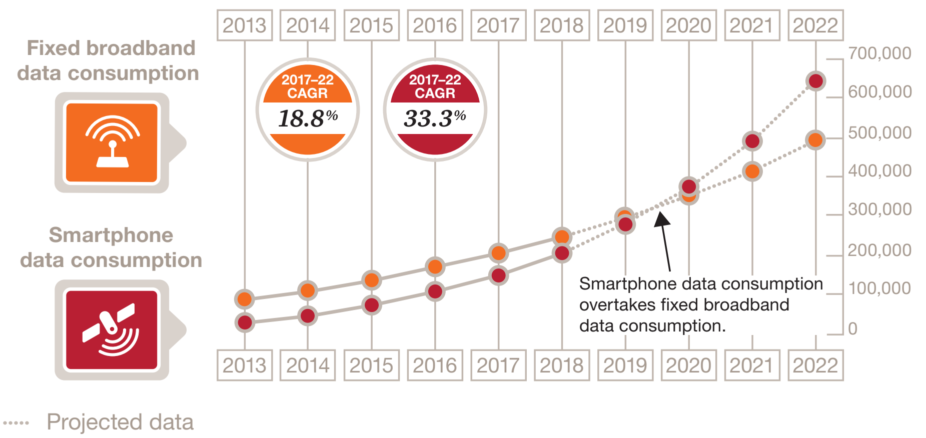
Overall music revenue continues to rise, but demand is shifting from downloading to on-demand streaming content.



Source: PwC Global Entertainment & Media Outlook 2018–2022, www.pwc.com/outlook

Exhibit 6: Global fixed broadband vs. smartphone data consumption (MB bn)

By 2020, smartphone data consumption will overtake fixed broadband, even as both continue to grow rapidly.



Source: PwC Global Entertainment & Media Outlook 2018–2022, www.pwc.com/outlook

MSO players. All are building or buying fibre and spectrum. Wi-Fi hot spots are becoming ubiquitous in public spaces. Usage of mobile data is expected to increase (*see Exhibit 6*). And as 5G gains uptake and usage, fixed broadband will face growing competition from wireless. In turn, 5G is expected to act as a major growth driver for entertainment and media offerings. Improvements in speed, quality and reliability will positively affect areas such as mobile gaming, and players will have the ability to deliver more live video as well as immersive virtual reality (VR) and augmented reality (AR) experiences.

Convergence in business models

One interesting development is that highly successful companies that began life with very – even radically – different business and revenue models are converging on a similar macro business model. Consider that Amazon is predominantly an Internet retailer, Disney is a content factory, Netflix began life as a DVD-rental-by-mail business and Apple rose to prominence in PCs and mobile devices. And yet today, each is simultaneously acting as a producer, distributor and retailer of content.

We are also seeing convergence among content, advertising and e-commerce, as a single user expression or impression can lead frictionlessly to a transaction – whether it is a video game player purchasing equipment for his avatar, an Amazon Prime shopper downloading a movie recommended to her by an algorithm or an Instagram user scrolling through her feed for fashion tips and making an in-app purchase after viewing a video from one of her favourite brands.

Among more focussed players, especially in the publishing industry, we see convergence in building a greater level of direct-to-consumer revenues involving subscriptions, live events, e-commerce, licencing and consumer products.

We'll take a closer look at business models and new revenue streams in chapter 4, beginning on page 15.

Convergence in geographies

Finally, we are seeing that companies – especially the largest ones – are converging on global markets. It's not an imperative for success in every instance, but the cost of scaling into new countries has fallen, and fresh markets offer attractive growth opportunities. Chinese players such as online and mobile payments provider AliPay and Wanda are competing aggressively in Europe. The National Basketball Association (NBA) is simultaneously seeking to expand sales of its League Pass on a global basis, to play more games in London and Mexico City and to build audiences in China and India. (See "NBA Commissioner Adam Silver Has a Game Plan," by Christopher Vollmer and Daniel Gross, *strategy+business*, Apr. 30, 2018.) Netflix (in 190 countries) and Amazon are driving global expansion of their video streaming businesses. Theatre operator AMC just opened its first cinema in Saudi Arabia and plans to expand to 100 theatres there by 2030. In today's environment, the prospect of operating globally isn't only for giants. Business Insider, the startup news site acquired by Axel Springer, has editions in the UK, Germany, South Africa, India, Italy, Malaysia, Japan and several other countries – including editions in local languages.

Supercompetitors and relevance at scale

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As convergence plays out, the question arises: what will the entertainment and media ecosystem look like in the future? The forces driving convergence will likely lead to the emergence of supercompetitors. This handful of global players that converge towards similar business models will unite content, commerce, advertising, communications and deep financial resources under a single corporate roof. Each will be looking to secure exclusive control of every aspect of its own customer relationships, consumption and activity.

In the early 2000s, the analogy of the walled garden was commonly used to refer to online companies that looked to fence off their offerings from the rest of the Internet and offer exclusive experiences and content. The supercompetitors have refined and expanded this concept to the extent that their walled gardens have effectively become 'walled savannahs,' in which consumers can roam freely without feeling unduly restricted in terms of choice and scope. Today, this type of business is exemplified by companies such as Amazon and Tencent that combine content, commerce and communications with massive financial resources – attributes that enable them to expand globally in a world that's balanced between Eastern and Western behemoths.

As platforms assume a greater role in the E&M ecosystem, some already large companies that are not currently viewed as platforms may choose to consolidate further in response, creating another group of supercompetitors. Large companies that choose to compete will have to develop greater depth. That line of thinking undergirds the decision of Time Warner to sell itself to AT&T, Disney's decision to purchase 21st Century Fox assets in December 2017 (and Comcast's effort to disrupt it by launching a bid to buy Sky TV, which is 39% owned by Fox) and the ongoing merger talks between CBS and Viacom.

Relevant at scale

Given the domination of a group of global supercompetitors that are involved in most if not every segment of E&M, as well as other sectors, what can smaller

The rise of the supercompetitors has created a deep-pocketed class of market participants that can buy content, invest in startups and serve as buyers for maturing businesses.

E&M players do to stay in the game and compete effectively? Is there a way to play that's not dependent on participating in an arms race for global scale?

In our view – based partly on the insights in this year's *Global E&M Outlook* – the answer is a resounding yes. It's not that in a world of supercompetitors with ever-rising scale, everyone else becomes niche. Or that players face a binary choice of seeking mass or being satisfied with defensible niches. Rather, the imperative is to build a business that has a relevant scale – that is, it has a reach or intensity sufficient to matter to users, advertisers and partners.

After all, the rise of the supercompetitors has created a deep-pocketed class of market participants that can buy content, invest in startups and serve as buyers for maturing businesses. Amazon paid US$900m for Twitch in 2014, for example. Netflix's projected US$8bn spending on content in 2018 is finding its way to production companies, studios, agencies and content creators of all sizes.

More broadly, convergence has changed the nature of competition. Those who succeed will do so by focussing on direct user relationships, forging commercial bonds with fans, using data to provide an excellent user experience, creating compelling advertising products and generally leveraging the loyalty and engagement that quality content can create. And these attributes are not the exclusive domain of very large companies. Far from it. In fact, in many ways, smaller companies may be better placed to develop the fan-based user streams that are so vital in a converged world.

In the media space, companies as diverse as Activision Blizzard, WWE and Barstool Sports are all thriving because they can create top-quality content experiences, build authentic and direct relationships with users and monetise those connections in multiple ways.

Scripps Networks, the lifestyle TV network portfolio that owns Food Network and HGTV, has sold itself to Discovery, owner of networks such as Discovery Channel and Animal Planet, in a merger aimed at creating greater scale in nonfiction, nonscripted video entertainment. Meredith acquired Time Inc. not because it wanted the flagship *Time* and *Fortune* titles (in fact, it is selling them). Rather, it wanted to bring Time Inc.'s women-targeted and lifestyle publications, such as *InStyle* and *People*, under the same umbrella as its complementary brands, such as *Better Homes & Gardens*. In both instances, the two merged companies' lifestyle genres attract passionate enthusiasts and bring greater scale among mainly female audiences. The mergers not only allow the aggregation of more first-party data about users, but also make the companies more attractive partners for advertising, e-commerce and product licencing.

Other examples: By focussing on cable systems in Europe, the Middle East and the United States, Altice has emerged as a large and powerful player. The *New York Times* and *Washington Post* are adding paid digital subscribers with remarkable speed. And Imax in April 2018 struck a deal to open dozens of its high-concept theatres in China.

By building up relevant scale in a single market, companies can develop multiple streams while offering an alternative advertising and marketing outlet beyond the big platforms. In the Netherlands, Talpa has combined under a single roof commercial broadcast television, several commercial music radio stations, its own music streaming business (Juke), several popular online sites and the tech platform Diffrnt.

Big fans of fans

The key to this mentality, as Christopher Vollmer pointed out in a 2017 *strategy+business* article, "How to Make Entertainment and Media Businesses 'Fan'-tastic," is to focus on fans, the core users who spend time, attention and money engaging with the content and with the company. In an age of constant distraction and endless choice, the value of devoted users grows significantly.

In seeking to sell its general entertainment assets to Disney, 21st Century Fox is creating a narrower 'New Fox' that will focus on two fan-based businesses: live sports and news (Fox News has one of the most passionate user communities in the US).

Other highly successful fan-focussed entertainment and media businesses are thriving in an era of supercompetitors. WWE, the professional wrestling giant, has 1.8m subscribers to its streaming video-on-demand service, WWE Network. Spotify, the streaming music behemoth, has between 92m and 96m paying subscribers.

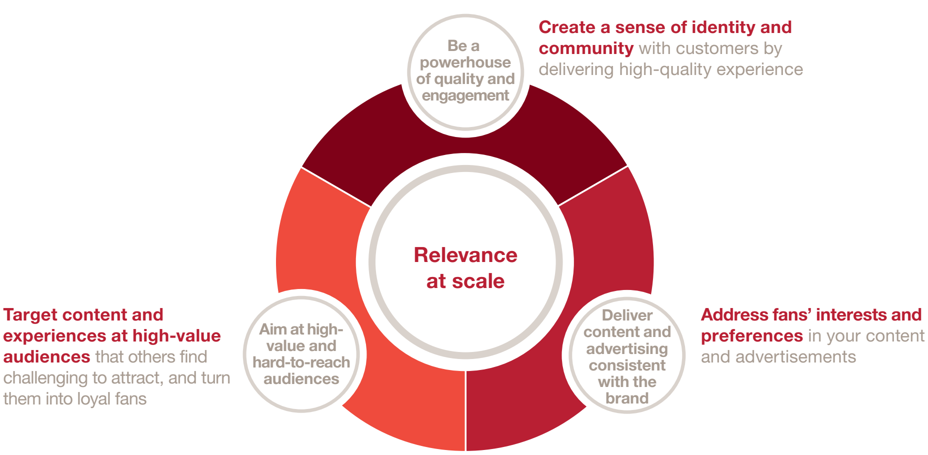
At times, relevant scale in these businesses can appear niche-y. But there are many highly defensible niches that offer room for growth. Peloton, which offers personalised exercise bikes and services, broadcasts indoor cycling classes live to connected devices 24/7. Peloton has developed into a high-growth converged media device business with relevant scale. It has 600,000 subscriptions with annual churn of just 0.3%, and 8,000 exercise classes streamed on demand. M. Shanken, a lifestyle media brand primarily for male luxury consumers interested in wine, smoking and spirits, has built up a network of destination sites, including Wine Spectator, Cigar Aficionado and Whiskey Advocate.

Relevant capabilities

What capabilities does it take to build relevance at scale? Our research and industry experience point to three vital ones (*see Exhibit 7*):

- ***Be a powerhouse of quality and engagement:*** as creators of high-quality and distinctive content, successful players are true specialists who are passionate about their subject

Exhibit 7: Capabilities to build relevance at scale



Source: PwC

A brand's video, article, music or podcast is more likely to be seen, read or heard by the fans for whom it was created.

matter and care about delivering a high-quality experience for their audiences and fans. These attributes create a sense of identity and community between the brand and its customers that is not easily matched.

- ***Aim at high-value and hard-to-reach audiences:*** most successful players target their content and user experiences at high-value audiences that others find challenging to attract, engage and aggregate. They also tend to be highly efficient and effective at reaching these audiences and turning them into active fan communities. Largely as a result, these focussed players enjoy a very high concentration of defined user/fan groups. Many members of their audiences self-identify as loyal fans, and in turn recommend the brand and content experience to others, which further accelerates organic growth.

- ***Deliver content and advertising consistent with the brand and user expectations:*** advertisements and content focussed on a specific experience, a narrowly defined theme or a fan community are more likely to be consistent, to be viewed, to be brand safe and to be in the right context for the users. It also holds true that a brand's video, article, music or podcast is more likely to be seen, read or heard by the fans for whom it was created. In other words, when it comes to getting people to consume the content a company is offering, addressing its fans' interests and preferences brings benefits in terms of both subscriptions and advertising.

To the casual observer, it will appear as though it's the supercompetitors that are taking over the world and absorbing all the incremental growth. But those who look more closely can clearly see space beneath the ambit of the global giants in which comparatively smaller and more focussed companies can mine a rich vein of revenues.

Reinventing media business models

A deep dive into the data reveals something of a disjunction. On the one hand, the overall volume of E&M spending continues to rise at a steady, reliable clip along with economic growth, placing the industry in the same bucket as consumer products and similar sectors. On the other hand, underneath the seemingly placid top line, an immense amount of churn is taking place, with different subsectors and geographies on sharply different – and occasionally volatile – trajectories. All this contributes to players' sense of an urgent need to rethink and reengineer their business models. At every point in the value chain, in every country, companies are having to reconsider precisely how and where they generate revenues and what role they play in the E&M ecosystem.

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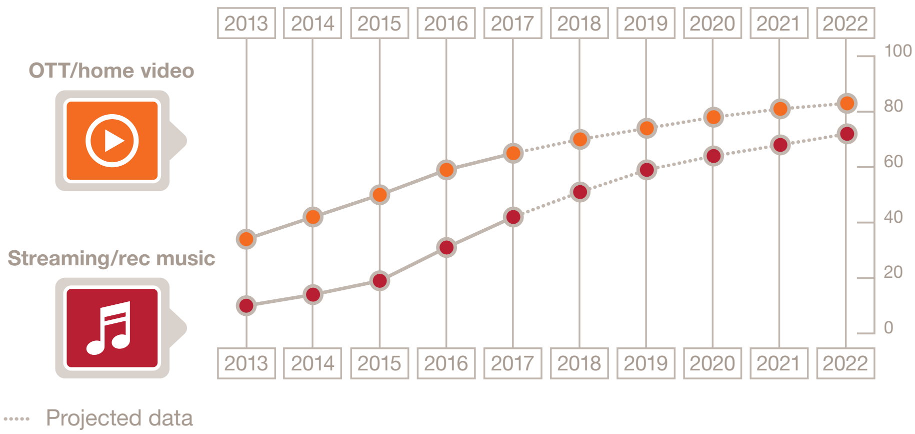
Take advertising. Global spending on marketing is rising, especially the digital component. But there is a widespread concern over the viability of existing models that centre on advertising.

- In *digital advertising*, the duopoly of Google and Facebook continues to gather the lion's share of US digital advertising, about 57%. One result of this dynamic is that digital publishers that were the darlings of the industry just a few years ago – BuzzFeed, Vice, Mashable and many others – have struggled to meet ad sales targets that were formerly achievable. Mashable, valued at US$250m in 2016, went for a fire-sale price of US$50m in November 2017. DNAinfo, which owned local news sites such as Gothamist, simply closed its doors.

- In *TV advertising*, so many commercial pods have been stuffed into prime-time shows that it's had the effect of driving viewers away from consuming linear ad-supported video. TV networks are reducing their ad loads and innovating with ad formats: for example, in February 2018, NBCUniversal said it was planning to cut ad time during its prime-time shows by 10% and to reduce the number of ads in its pods by 20%.

Exhibit 8: Global streaming share of recorded music revenue and OTT share of home video revenue (%)

The rise of streaming has shifted revenues away from advertising and towards subscriptions.



Source: PwC Global Entertainment & Media Outlook 2018–2022, www.pwc.com/outlook

Large segments of the consumer marketing world are now choosing direct-to-consumer models and building brand-direct marketing and media capabilities.

- *Ad skipping and ad blocking* are having an impact, as consumers act on their preference to avoid advertising by using ad-blocking tools, skipping ads, consuming shows on DVR and fast-forwarding through the ads, or simply doing something else during ad breaks. In February 2018, Google said it would build an ad blocker into its Chrome browser to protect users from the most intrusive and annoying online ads.

- Large segments of the consumer marketing world are now choosing *direct-to-consumer business models* and building brand-direct marketing, e-commerce and media capabilities, creating a significant ripple effect on media and advertising. Digital-first boutique brands that don't rely on physical retail or on mass advertising have been making headway, including Dollar Shave Club (razors), Casper (mattresses), Warby Parker (eyewear), Away Travel (travel), Birchbox (beauty), Everlane (apparel) and the Honest Company (household products). They largely eschew advertising on television, radio, newspapers and digital publications in favour of content experiences designed for social media, e-commerce and their own branded assets. Amazon, with its Prime shopping platform, has emerged as a locus for advertising. JPMorgan Chase estimated that Amazon's ad revenues were US$4.5bn in 2017.

- *Growth in streaming video-on-demand (SVOD) and OTT subscription*. Whether Netflix or Amazon Prime, the NBC Sports Gold Cycling Pass or the NBA League Pass, HBO Now, Hulu or CBS All Access, SVOD and OTT subscriptions are one of the fastest-growing components of the video ecosystem. And they are primarily ad-free. With each passing month, a greater proportion of premium video viewing is taking place through subscription-supported environments, especially among affluent households (*see Exhibit 8*).

Developing new streams of revenue

Given the prospect of such disruptions, it's hardly surprising that building new revenue streams is at the top of the agenda for every player in the E&M industry, especially those that are currently reliant on advertising. In fact, companies are exploring an expanding array of strategies to build new streams. (For a more thorough description, see "The Revenue Stream Revolution in Entertainment and Media," by Christopher Vollmer, *strategy+business*, May 7, 2018.) Some approaches are listed below.

Maximising distribution reach by monetising existing core brands, products and intellectual property through new channels and platforms, either owned and operated or accessed via partners. In less than three years, HBO Now, the channel's on-demand service, has attracted 5m subscribers. CBS All Access, the television network's subscription video service (offered with limited commercials for US$5.99 per month or commercial-free for US$9.99 per month), debuted in the fall of 2014. Powered by exclusive original series such as *Star Trek: Discovery* and *The Good Fight* (a spin-off of the popular CBS Network series *The Good Wife*), the video service has grown to 2.5m subscribers, adding approximately 500,000 in the last year.

Developing new ad products. Sky's AdSmart platform serves addressable households (those within a defined or targeted audience) different ads during the same TV programming, targeting viewers' demographics, location, shopping habits and behavioural attributes. Sky has created more than 1,200 audience segments – examples include 'sports car fans' and 'luxury travellers' – that advertisers can target. Sky charges a significant premium for AdSmart ad units, up to eight times the rates for non-addressable TV inventory.

Closing the loop between user engagement and commerce activity. Video game company Ubisoft, like its peers Activision, EA and Take-Two, has shifted its strategy from releasing annual blockbusters to reinventing franchises such as Assassin's Creed and Tom Clancy's Rainbow Six Siege as live digital services. In-game microtransactions, or what Ubisoft refers to as 'recurring player investments,' such as a US$4.99 'unicorn mount' for Assassin's Creed players, grew 87% in fiscal year 2018, and now represent 27% of total company revenue.

Extending the brand from media properties into new revenue streams through physical experiences and products. Tasty, BuzzFeed's foodie brand, parlayed its massive social media fan base across Instagram (17m followers), Facebook (94m likes) and YouTube (6m subscribers) into a multimedia franchise that now also includes an eponymous best-selling cookbook and a line of Tasty-branded kitchen tools at Walmart.

Encouraging a membership mind-set that allows a company to sell premium media experiences and related benefits, products and services. The New York Times Company saw its digital subscriptions soar from 910,000 in 2014 to 2.64m in 2017. The engaged subscriber fan base has become an attractive monetisation target for consumer offerings such as travel (New York Times Journeys), product recommendations (Wirecutter, a site acquired in 2016) and events (Times Talks, New York Times conferences and subscriber events).

Prospecting for new revenues in entirely new entertainment and media markets. Video games publishers and sports entertainment entities increasingly view e-sports as their next big revenue growth engine (see "Video Gaming Levels Up into a Sport," by Bob Woods, *strategy+business*, Apr. 23, 2018). Tencent's Riot Games has introduced a franchise structure for its North American League of Legends Championship Series (NA LCS). Activision has created a professional league around Overwatch. Electronic Arts is developing e-sports competitions for both its Madden and FIFA franchises.

Globalising aggressively by pushing into new geographic markets. Netflix is currently available in 190 countries. Having grown tenfold between 2012 and 2017, international subscribers (62.8m) now exceed the company's domestic subscribers (54.8m). Netflix curates content, in any language, that would appeal to the nearly 2,000 'taste communities' it identified during the course of its global rollout. Taste communities are groups of subscribers around the world who are fans of certain types of content, regardless of where they live.

Business model innovation has much further to run

As the drive to create new E&M business models continues, it's clear that the pressure driving this wave of innovation – not least the squeeze on ad revenues – won't ease off anytime soon. So the reinvention has much further to run, and the industry-wide move to tap into and develop new streams may have only just begun. Ongoing advances in technology will be one of the main forces that aid in that effort.

New technologies – new battlegrounds

5

Across all segments of E&M, technology is enabling cheaper and more personalised content delivery. That is having the effect of squeezing out less efficient players, intensifying pressure on all links in the value chain and opening the way to the creation of new formats, such as e-sports. For all participants in E&M, cost efficiency is an important element of future viability. And the more traditional conglomerates, many of which have legacy cost structures in place, find themselves competing against challengers with different cost structures. This only heightens the sense of urgency with respect to investing in new technologies that can help companies compete more effectively.

Data analytics and insights

As business models and capabilities change, it's clear that data and analytics will play a pivotal role in E&M. Today, many companies still lack the data and analytics capabilities they need to deliver content, advertising and other experiences to the right users at the right time and in the right context – although this is clearly a high-priority investment area for many.

As companies in E&M pursue new revenue streams, first-party data has emerged as perhaps the most valuable asset. Schibsted, the Norwegian media company, has developed prediction models that determine how likely it is that an ad-supported user can be converted to a subscriber. After analysing first-party signals such as the frequency of visits, it assigns each user a 'propensity score' that indicates his or her likelihood to subscribe (high, medium or low). Schibsted then tailors the user experience (by, for example, enticing high potentials with greater content access before they hit the paywall) to encourage conversion. The model identifies readers who are three to five times as likely as average users to subscribe.

One component of the technology impact is the growing importance and centrality of data and analytics to all media operations (*see box on data analytics and insights*).

PwC's essential eight

PwC analysed more than 150 emerging technologies to pinpoint the essential eight: a set of technologies that every organisation, both in E&M and beyond, must consider in formulating its tech strategy (*see Exhibit 9*).

Although each will play a significant role in E&M, it's clear that one (AI) will dominate, two others (AR and VR) are already beginning to play supporting roles and a fourth (blockchain) is likely to enter the conversation.

AI will have a pervasive impact on all types of companies involved in E&M and will become the industry's new battleground.

The impacts will be many and highly diverse. Netflix's recommendation algorithm is one prominent example of how AI builds consumer engagement and satisfaction. But in the next few years, more and more telecommunications companies will launch voice-controlled AI assistant interfaces for their pay-TV and smart home products and services. This widespread adoption of AI will not only enhance the customer experience that companies provide, but will also allow them to protect their relationships with consumers. To date, Amazon's Alexa and Google Assistant have been prevalent in the market for AI-enabled virtual assistants. But fierce competition is coming, in the shape of the next generation of AI-powered 'smarter phones,' which will combine voice interfaces with the use of algorithms to anticipate and infer users' intent.

AI will also continue to advance on other fronts:

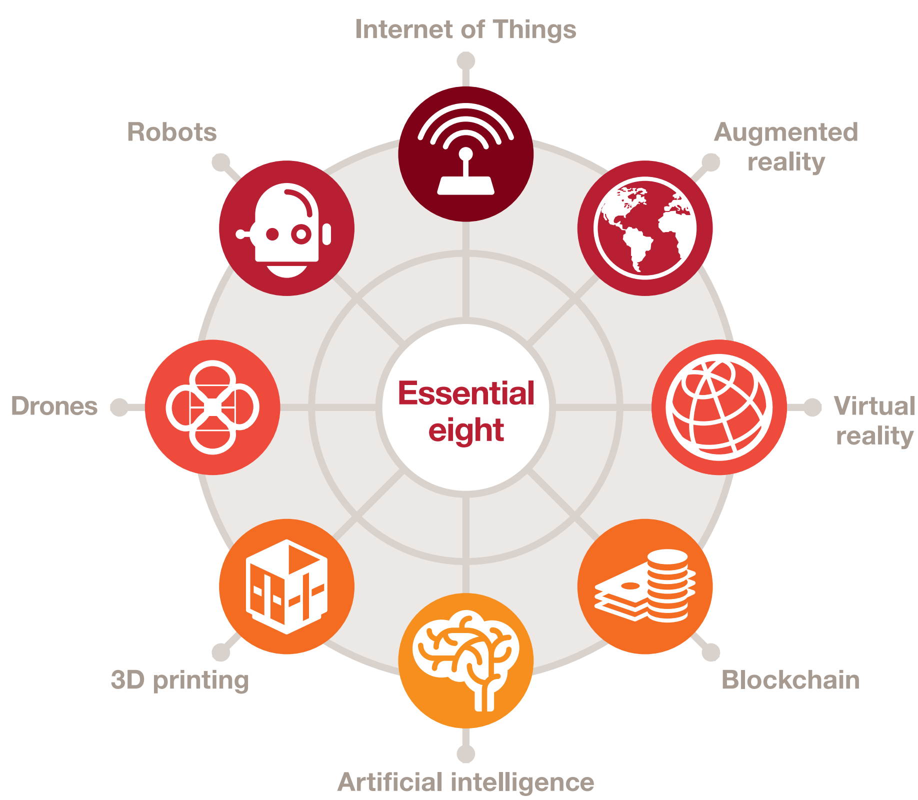
- NBCUniversal, which is reducing the number of ads in its prime-time shows, said it would use a new AI-driven targeting tool to make its ads more relevant for audiences.
- Mimicking techniques perfected by the airline industry to maximise ticket revenue from seat sales, game publishers are using data to adjust prices dynamically for microtransaction items based on user demand. They also analyse player context to determine where, when and how to best merchandise and promote items to users in-game.
- Like companies in most other industries, media firms have started experimenting with AI in areas such as voice control and chatbots. As experimentation starts to turn into real products, 2018 is seeing the emergence of production-grade tools from firms including Amazon Web Services, IBM and Google that can help E&M providers build more engaging services, delight customers more effectively and drive additional revenues.
- Factmata, a startup that uses AI to spot fake news, hate speech, abusive content and extreme clickbait, has raised funds from investors including Internet entrepreneur Mark Cuban.

AR and VR take off

The potential power of AI in E&M is further increased by the opportunity to combine it with other emerging technologies, especially virtual reality

Exhibit 9: The essential eight technologies

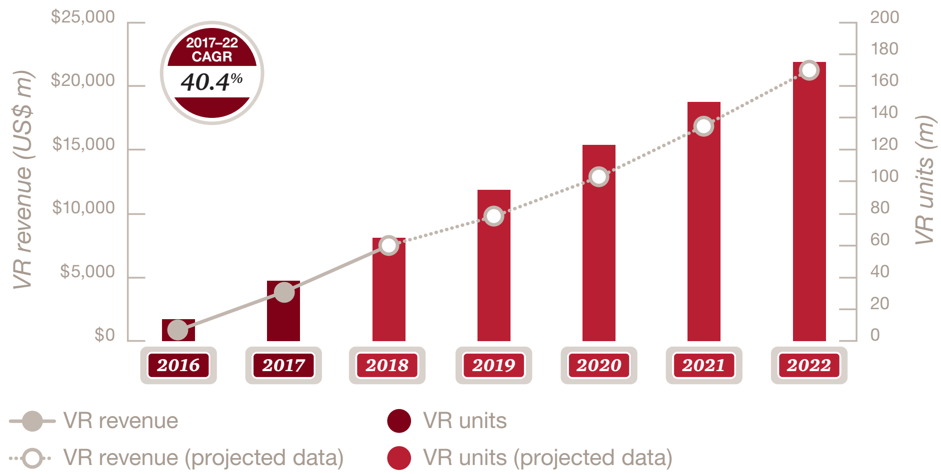
Companies in every industry, not just E&M, must reckon with these innovations.



Source: PwC

Exhibit 10: VR growth in 10 key markets*

Sales of VR headsets are projected to rise and bring revenues along with them.



* US, Japan, China, South Korea, UK, France, Germany, Russia, Italy, Spain

Source: PwC Global Entertainment & Media Outlook 2018–2022, www.pwc.com/outlook

Blending AI and VR/AR can have a transformational impact on the ability to derive actionable data on consumers' behaviour.

and augmented reality. Revenues from VR apps, gaming and video, which were US$3.9bn in 2017, are expected to soar more than fivefold by 2022 (*see Exhibit 10*). In the VR space, the installed base of headsets is projected to grow substantially, helped by Facebook launching its US$199 untethered Oculus Rift in the second quarter of 2018 for gaming, education and enterprise use. The price point is significant: the Rift originally sold for US$599, and required a computer costing several hundred dollars to power the related VR experiences and games.

Blending AI and VR/AR can have a transformational impact on the ability to derive actionable data on consumers' behaviour. For example, the VR analytics company Retinad has developed heat-map technology that tracks where a person in a virtual environment looks and for how long. In the future, apps could harness that data to create experiences geared to specific individuals.

One media business that is leading the way in promoting and applying VR is the UK's Guardian Media Group. The website of the company's flagship newspaper, the *Guardian,* offers readers a free downloadable VR app, together with a click-through opportunity to buy a Google Cardboard headset. One day in October 2017, it bundled a Cardboard headset free with every edition of the newspaper. Using the headset and app, readers are offered VR experiences such as investigating a murder scene or exploring subterranean London.

The Void, a location-based VR startup that has rolled out a *Ghostbusters* VR experience in four locations, has created a *Star Wars*–branded experience, 'Star Wars: Secrets of the Empire,' at Disney resorts. The experience integrates the Void's hardware and software with the physical space.

VR will remain significant for E&M companies, but mobile AR is poised to play an even more transformative role for the industry. After the massive success of

Pokémon Go, and both Apple and Google announcing their platforms for mobile AR (ARKit and ARCore, respectively), 2018 is poised to be a breakthrough year for these types of applications.

Games will continue to dominate in the mobile AR category. But several other key app types will also grow, including navigation, home improvement and experiences designed by brands to increase consumer engagement. Also, alongside E&M companies, we'll see other (often closely adjacent) industries adopt both AR and VR to create immersive customer experiences. These adopters will include museums presenting collections virtually and football clubs offering remote action experiences – thus competing for user attention that used to belong to E&M.

NextVR and the NBA have partnered to create a VR experience for subscribers to the NBA's League Pass. Shooting the action with eight specialised cameras, NextVR captures angles of the game and streams them live to subscribers who are watching through NextVR's Samsung Galaxy Gear VR – so that they can effectively be just behind the hoop as LeBron James swoops in for a thunderous dunk. In 2018, Intel created a March Madness Live VR app to allow fans of college basketball to experience NCAA tournament games in new ways while watching through Samsung and Google devices.

Blockchain plays a greater role

The emerging technology of blockchain is likely to evolve as an enabler of digital transformation for E&M companies. Blockchain has the potential to grow into a key capability, helping companies keep track of content assets, avoid contractual disputes and establish the certainty and accountability that will foster trust with business partners and customers. Looking more widely across the E&M ecosystem, commentators have highlighted that blockchain could bring benefits in areas as diverse as royalty tracking and collection, crowdfunding of creative productions, digital advertising impact measurement and piracy prevention.

To respond effectively to this expansion in the competitive environment, media companies should work out how to partner with organisations that have expertise in the relevant new technologies.

However, these are just initial steps – and the next frontier has yet to be crossed: securing the data, using it to improve experiences and monetising it more effectively, all while retaining and growing customers' trust. That's the looming challenge for the industry.

Blockchain could bring benefits in areas as diverse as royalty tracking and collection, digital advertising impact measurement and piracy prevention.

Trust: from table stakes to differentiator

6

The level of trust in companies among both consumers and business-to-business customers is an increasingly prominent topic of debate, and E&M companies are intensely affected by it. Trust will also be a vital determinant of the sector's ability to attract and sustain revenues in the future, from both subscriptions and advertising (*see Exhibit 11*).

Exhibit 11: Five vital dimensions of trust

Is your content trustworthy?

Advertisers are raising questions about the quality, safety and appropriateness of the content advertisers advertise against.

Is your audience who you say it is?

Media and academic reports have suggested that many social media accounts are bots.

Are you taking proper care of the data?

More E&M companies are assuming more responsibility for protecting credit card numbers.

Are your investments paying off?

Direct measurement of audience engagement – whether an agency is delivering the promised audience to a client – has not been answered to satisfaction.

Is your company good for society?

The sheer size, reach and utility of today's media platforms are resurfacing this philosophical question.

Source: PwC Global Entertainment & Media Outlook 2018–2022, www.pwc.com/outlook

E&M isn't alone in depending crucially on its ability to build trust for its long-term well-being. The industry shares that need with others including technology, financial services, automotive and professional services. But the rising importance of data – and the central place that the usage, storage, sharing, mining and safety of consumer data plays in the emerging landscape – is pushing trust to an even more central position. In the old environment, it was comparatively easy for E&M companies to build trust with consumers, customers, clients and society at large. Today, things are more complicated. Companies today must demonstrate trust across multiple dimensions.

Content trust: is your content safe?

Broadly speaking, advertisers are raising questions about the quality, safety and appropriateness of the content they advertise against. As algorithms serve up millions of ads without human intervention –

sometimes accompanying videos with objectionable content – major companies have grown concerned about brand safety on some of the leading platforms. Global consumer goods giant Unilever threatened to pull its advertising from online platforms if they don't take steps to remove content that, in the words of CEO Keith Weed, creates "division in society and promote[s] anger and hate." Whether it takes the form of policing comments, imposing standards on news items or reinjecting human judgment into programmatic advertising, publishers, agencies and marketers must take pains to ensure that content is trustworthy.

Audience trust: is your audience who you say it is? Today's technology offers the tantalising prospect of ultra-precise audience measurement: who is watching and for how long? But legitimate questions have been raised as to how much faith can be put in the measurement. A series of media and academic reports have highlighted the presence of bots, or fake accounts, on social media platforms. Multiple investigations have shown that it is quite easy for people to create personas – even entire organisations – on social media platforms that don't exist in real life.

Data trust: are you taking appropriate and proper care of the data that consumers entrust to you? As more E&M companies enter direct commercial relationships with customers, whether selling products inside video games or signing up subscribers to OTT apps, they are assuming more responsibility for the protection of credit card numbers. In an age of large-scale hacks, it is natural for users to question whether it makes sense to transact so freely. At the same time, the ability of app developers to access the profiles of tens of millions of social media account holders has highlighted the dilemma of data protection – even in instances when users may have accepted terms and conditions that allow for the sharing of data.

Monetisation trust: are your investments paying off? Again, e-commerce and online advertising and marketing offer the potential for transparency and direct measurement. But questions about how audiences are measured, or the length of time people actually viewed an online video counted as a view, or what percentage of viewers are skipping ads, or whether a publisher is delivering the promised audience to an agency, or whether an agency is delivering the promised audience to a client have not been answered to everybody's satisfaction.

Ecosystem trust: is your company or industry good for society? This may seem like a philosophical question. But, again, within the past year, we have seen significant questions raised about the use of television networks as vehicles for propaganda, about the pervasiveness of hate speech on discussion boards and about the use of social media platforms by parties that sow division and ethnic strife. To a degree, this is nothing new. In the 1960s, FCC Commissioner Newton Minow railed against television as a vast wasteland. (Now television is regarded as the locus of much of the finest programming.) In the 1980s, prominent Washington figures campaigned against explicit lyrics in rap music. (Hip-hop has since become mainstream.) But the sheer size, reach and utility of today's media platforms are making them a target once again.

Trust as a differentiator

Typically, trust would be seen as a qualifier that supports a business's or industry's licence to operate. But a strong case can be made to view and treat trust as a differentiator. Companies that have trust with everyone they do business with will enjoy a competitive edge over those that don't – from private individuals to massive corporate business partners.

How do companies build trust? Obviously, it starts with the content and the brand. A greater sense of transparency is vital if trust is going to be built within the entire ecosystem. Consumer products should take their cue from consumer-facing companies that have taken pains to share more information about their operations and products with consumers, vendors and the public. Patagonia created *The Footprint Chronicles*, an interactive guide that helps customers dig into its supply chain. Hershey is making nutrition data more prominent on packaging, and Whole Foods offers transparency on the use of genetically modified organisms. It is possible to build trust via the sharing of information without compromising competitive advantage.

Regulation

7

The ability to comply with evolving regulations continues to be a vital task for E&M companies – and it can be a catalyst in building trust.

The EU's General Data Protection Regulation (GDPR), which went into effect in May 2018, requires sweeping changes in how businesses and public-sector organisations handle and use their customers' personal information. As well as creating compliance challenges, the GDPR provides an opportunity for E&M companies to upgrade their systems, communicate superior protection for customers and demonstrate their trustworthiness.

Although significant, the GDPR is just one of the fundamental shifts under way in the global regulatory landscape, which has profound implications for E&M businesses in all segments and geographies. In many ways, the current regulatory trends are forcing every company's hand. But the good news is that complying with the new regulations can increase customer trust in E&M businesses.

Top policy trends for 2018

At a macro level, PwC has identified eight top policy trends for 2018 that in combination are reshaping the global regulatory environment (*see Exhibit 12*). These trends reflect growing challenges to the established architectures of trade, taxation, security and communications. Clearly, some of the eight trends we highlight in the exhibit will have greater impacts on E&M than others. One of the most significant is 'Do no harm,' which reflects the inherent tensions between safety and innovation. This trend could see tech – and especially social media – companies face new regulations affecting key areas of their business, including disclosure requirements for sources of online advertising and obligations to police user-generated content.

Another policy trend with particularly significant implications for E&M is 'Digital discontent.' Owing to rising dissatisfaction and concern with some of the effects of digital technologies, there is a heightened focus on and conversation about regulation. Indeed, just as E&M is experiencing convergence, the regulatory domain is also experiencing a degree of convergence. Social media companies are facing the possibility of being regulated in a similar way to how utilities were regulated a century ago, as operators of vital public services.

Exhibit 12: Top trends affecting policy and regulation in 2018

Source: PwC, Top Policy Trends of 2018

There are also differences between approaches to regulation at a regional level. In the US, questions are being posed about whether the regulatory environment may be becoming less favourable to supercompetitors and more favourable to incumbents. Meanwhile, in Europe, one of the by-products of concern about trust is a higher level of direct regulation (notably the GDPR) and calls for yet more regulation.

Self-regulation

One way to build trust is to engage with other E&M companies and even other industries to create a self-regulatory organisation (SRO), which sets agreed standards and monitors the signatories' behaviour against them. An SRO is an approach to regulatory oversight wherein the members of an industry or industry subgroup band together to define a set of rules or principles with which all the members of the group agree to comply. SROs are already commonplace in industries such as financial services; one example is the Financial Industry Regulatory Authority (FINRA) for organisations involved in securities brokerage. SROs are starting to emerge in E&M, through initiatives such as the recent collaboration to create 'trust indicators.'

SROs can be the most efficient way to strike a balance between the potentially negative impacts of rapid innovation and the responses of regulators and policymakers to mitigate those impacts. An SRO is not as constrained by national borders as traditional regulation tends to be. The overarching advantage of SROs is that they help build trust, because the member companies are collectively *choosing* to behave in an appropriate and ethical way. It's even possible to create a stamp of approval, by implementing an annual third-party certification process to ensure that those that have committed to complying with the principles are actually doing so.

Overall, what's clear is that regulation is changing – but that the E&M industry will continue to change even faster in terms of offerings, go-to-market strategies, business models, technology and trust.

Self-regulatory organisations help build trust, because the member companies are collectively choosing to behave in an ethical way.

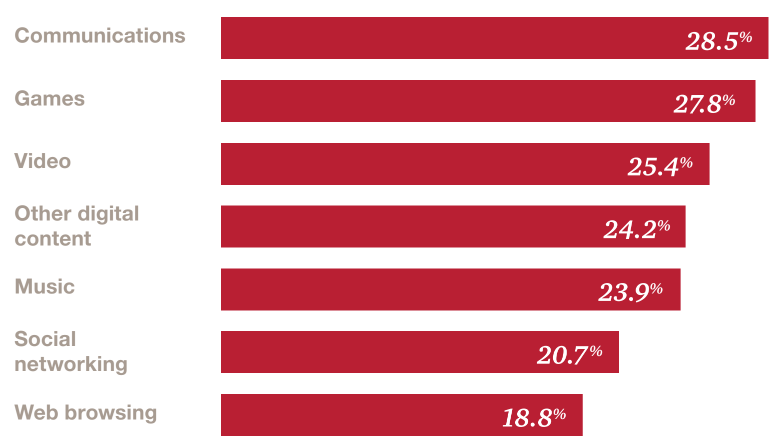
Looking to the future: above and beyond

8

The future holds both a great deal of promise and significant challenges. The good news is that, overall, the amount of time and money spent on E&M industries is growing throughout the world. And that trend shows no sign of slowing. Our lives may appear to be saturated with media. But every day, new viewers are coming of age and attending their first movie, millions of people are plugging into the Internet for the first time, or getting their first smartphone, or gaining enough income to spend on a digital publication (*see Exhibit 13*).

Exhibit 13: Data consumption CAGR by content type, 2017–22

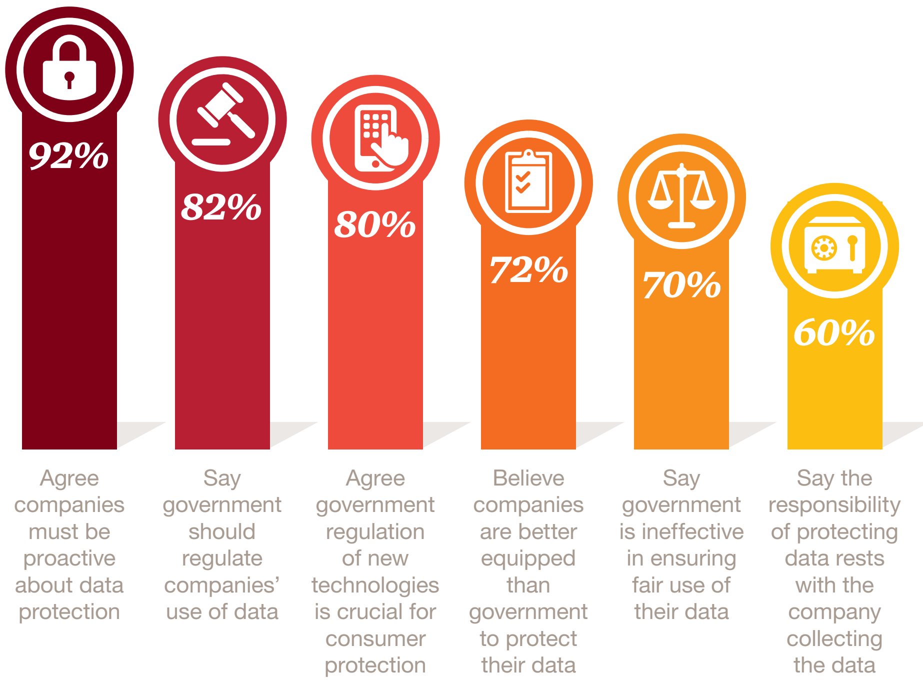
Consumers are expected to spend more time engaging in E&M sectors.



Source: PwC Global Entertainment & Media Outlook 2018–2022, www.pwc.com/outlook

The challenge is that the way in which that time and money is spent is shifting – in some instances, dramatically. For many, the business model that worked for the last 10 years may not work in the next 10 years. In fact, it may not work in the next three years. For many businesses, the models, assets, practices and capabilities that support their current market positioning likely will not be sufficient to carry them into the future.

Exhibit 14: Who's on the hook? Consumers say businesses more than government



Source: PwC US Protect.me Survey, 2017

The question is how companies should and will react to this reality. It is clear that armed with this knowledge (and with the robust data of the *Global E&M Outlook*), E&M companies will have to go above and beyond.

Above and beyond how they currently envision themselves: every E&M company now faces important choices about its future basis for competition. How will it seek to win? This choice is essentially between becoming a supercompetitor and building relevance at scale; between embracing complete convergence and embracing selective convergence. Whichever way this decision goes, the effort will bring its own challenges. Businesses seeking convergence must either muster the resources necessary for acquisitions and investment, or improve their ability at partnering – a capability that has not traditionally been core for media companies. Building relevant scale will require becoming a powerhouse of quality and engagement by having content creators who are as passionate about the subject matter as the target fans; engaging high-value, hard-to-reach audiences that can translate into powerful and distinctive fan communities; and maintaining consistency and brand safety with respect to content and advertising.

Above and beyond the way they currently make money: E&M companies must develop an urgency in the creation of new revenue streams. They must distil more value from the streams they currently have, continually prospect for new streams and adopt a strategic mind-set that permits

To build trust, companies should do more than what's required by law.

investment and experimentation to connect directly with users and monetise those relationships in new ways.

Above and beyond their current capabilities: E&M companies must build a strong content creation and curation capability, supported by a clear understanding of the economics behind it. But they must also develop a more refined understanding of customer segments and needs – including customers' willingness to accept advertising – by leveraging data and analytics. They must add team members who can focus on developing compelling user experiences and retention strategies, as well as building loyalty and understanding lifetime customer value.

Above and beyond the way they build and retain trust: a recent research report in PwC's Consumer Intelligence Series – *Protect.me* – finds that 85% of consumers will not do business with a company if they have concerns about its security practices, and 92% believe they should be able to control the information available about them on the Internet (*see Exhibit 14*). Given the ingenuity of hackers and the intensification of regulatory, social and media attention on data security and trust issues, companies have to redouble their efforts. To build trust, companies should do more than what's required by law. They should proactively manage cybersecurity and privacy risks in a way that goes beyond a compliance checklist approach and enables customers both to see the data held about them and to control how it's used.

In the E&M world, there is no guarantee of success, and no single path towards a viable future. Making long-term predictions is challenging, especially in this age of continual disruption. But our ongoing efforts to collect, analyse and understand data at a granular level, assess the impact of the trends affecting our world and lay out the strategic imperatives that all companies face allow us to approach the exciting vista with a sense of clarity and optimism.

Methodology and definitions

Historical data collection

All forecasts have been built starting with the collection of historical data from a variety of sources. A baseline of accurate and comprehensive historical data is collected in the first instance from publicly available information, including from trade associations and government agencies. When this data is used directly, these sources are cited accordingly. In addition, interviews with relevant associations, regulators and leading players have been conducted to gather insights and estimates not available in the public domain. When this information is collected, it is used as part of calculations, and the sources are proprietary.

Forecasting methods

All forecasts are prepared as part of a collaborative, integrated process involving both quantitative and qualitative analysis. The forecasts are the result of a rigorous process of scoping, market mapping, data collection, statistical modelling and validation.

Note: All data, charts and graphs (unless stated otherwise) in this publication are taken from the *Global Entertainment & Media Outlook*.

Definitions

Do you want access to consumer and advertising spending data at the click of a button? The *Global Entertainment & Media Outlook* is a comprehensive source of global analyses and five-year forecasts of consumer and advertising spending across 53 territories for 15 segments:

Books
Business-to-business
Cinema
Data consumption
Internet access
Internet advertising
Magazines
Music, radio and podcasts
Newspaper
OTT video
Out-of-home advertising
Traditional TV and home video
TV advertising
Video games and e-sports
Virtual reality

To access the full segment definitions for the *Outlook*, please visit www.pwc.com/outlook

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