



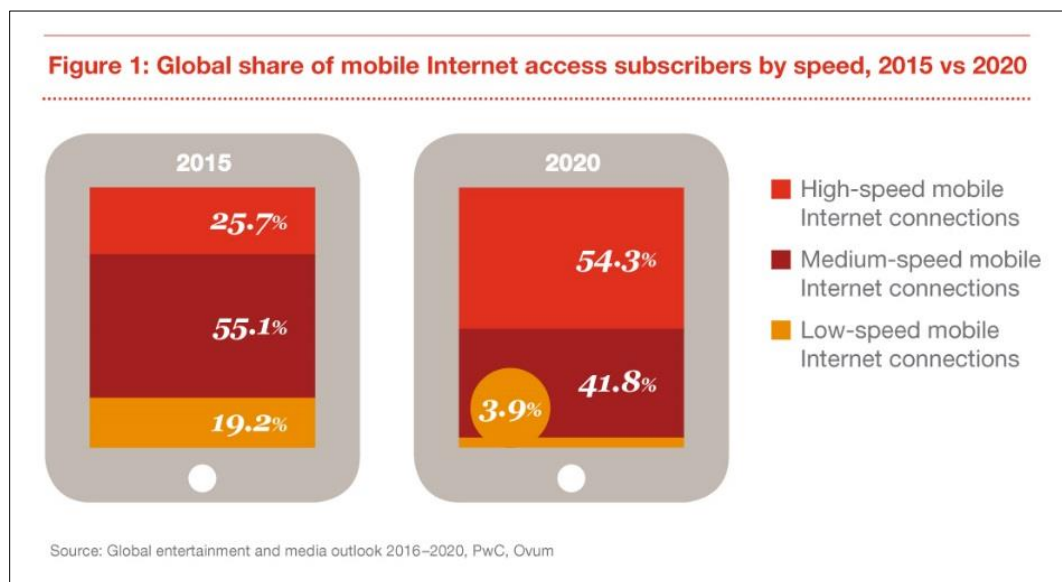
# Internet Access

*A virtuous circle kicks in: surging high-speed Internet access, more devices and more content combine to drive media consumption upwards worldwide*

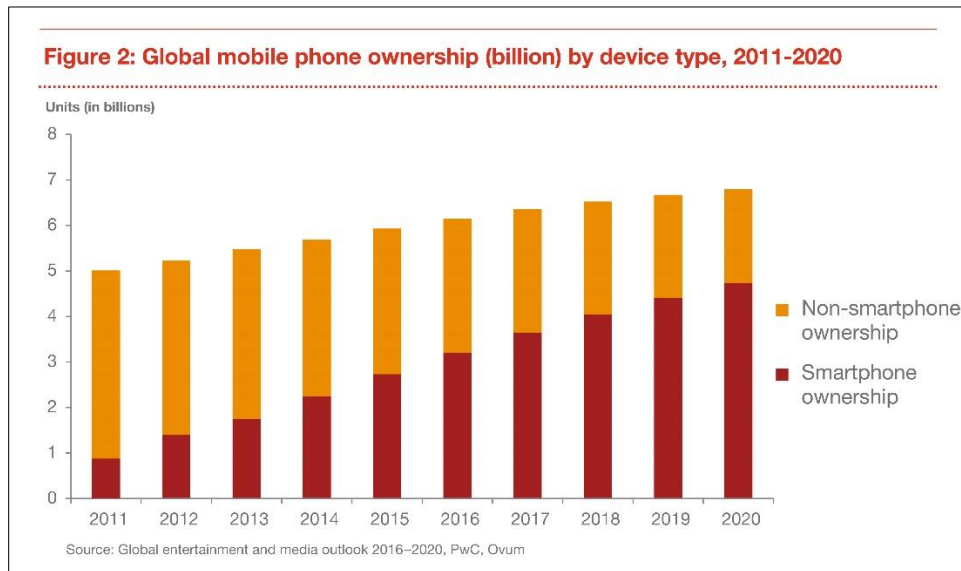
## As major tipping-points loom...

*To get a sense of how profoundly the combination of rising Internet access and ongoing rapid roll-out of connected devices is expected to reshape the global Entertainment & Media (E&M) industry over the next five years, consider the following market projections from PwC's Global Entertainment & Media Outlook 2016-2020.*

The first projection is that the total data consumed by devices globally is expected to grow at a CAGR of 35.7% over the five years to 2020. In total, 875trn MB of data is expected to be transferred in 2020, up from around 190trn MB in 2015. This forecast growth represents more than a quadrupling of the market between 2015 and 2020, by when 54% of mobile Internet connections globally will likely be high-speed (delivering 30+ Mbps), while a further 42% is expected to be medium-speed (between 4 and 30 Mbps). This dramatic shift towards higher bandwidths during the five-year forecast period will be driven by consumers increasingly choosing high-speed mobile Internet access services that enable new applications. The scale of this reshaping of the market is illustrated in Figure 1.



The second projection is that eight of the world's ten largest mobile Internet markets in 2020 in terms of mobile Internet subscribers is expected to be in the developing world. India is expected to overtake the US in 2016 to take second place, and Brazil and Indonesia will likely have edged Japan out of the top five by 2019. And also by 2020, mobile is expected to account for over 50% of Internet access revenue in more than three-quarters of countries worldwide, as smartphone ownership surges by over 2bn to reach 4.7bn in 2020, accounting for seven out of ten of the world's mobile phone connections (see Figure 2).



### **...global trends will drive local divergences**

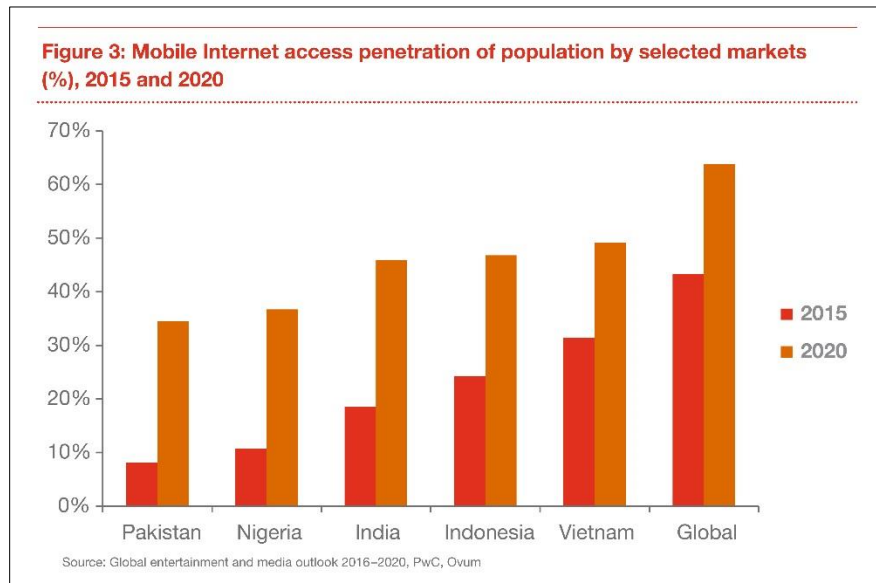
These projections for Internet access and device usage and revenue – and the dramatic shifts they will trigger between different geographies, technologies, sectors and consumption behaviours – underline a core theme of this year’s E&M Outlook: the emergence of a global media landscape that’s multi-shifting, diverse and fast-evolving. We’ve termed this phenomenon a “world of differences”, reflecting the fact that E&M globally is experiencing ongoing change and disruption whose nature and impact varies between segments and geographies – resulting in drastic slowdowns in some areas and stagnation in others, coexisting with spectacular expansion in “hot” sectors, countries and regions.

In the Internet access segment, this “world of differences” manifests itself clearly in the way the same global trends are having sharply contrasting impacts in different markets. For example, global growth in Internet access revenue between 2015 and 2020 will be driven primarily by vast numbers of new customers, especially for mobile services – with more than 1.3bn people starting to pay for mobile Internet access for the first time during the five years, taking the total to 3.8bn. But the dynamics underlying this growth will differ markedly between emerging and developed markets.

In emerging markets, growth is expected to be driven largely by operators signing up first-time customers at low prices, but in massive numbers. In developed markets, revenue is expected to increase thanks to a lesser, but significant, number of new customers, combined with existing subscribers paying more for higher-speed services and larger data allowances. This divergence is likely to have significant consequences in terms of average revenue per user (ARPU). In the US, faster and more reliable services will see mobile Internet ARPU grow to US\$25 per month by 2020. On the other hand, in Kenya – for example – the pressure to grow subscriber numbers as rapidly as possible will see ARPU fall over the next five years to just US\$4 per month.

### **Growth opportunities remain in emerging markets...**

However, despite the rapid growth in smartphone connections, more than a third of the world’s population still won’t have mobile Internet access in 2020 – the majority of them living in large, high-growth emerging markets, such as Pakistan, India, Nigeria, Indonesia and Vietnam. Profitably serving just the current wave of new subscribers in emerging markets is a challenge for both operators and media companies, let alone the harder-to-reach populations.



So, while mobile Internet access growth in the developed world will likely start to reach a saturation point by 2020, there will be plenty of growth left in developing markets. Penetration rates is expected to be lower than 50% in India and Vietnam, and below 40% in Pakistan and Nigeria (see Figure 3). Partly as a result, growth in mobile Internet access revenue in these countries will continue to be rapid, with year-on-year rates remaining in double digits – and as high as 21.2% year-on-year in 2020 in Pakistan. However, low incomes mean many consumers will likely struggle to afford premium digital media, as well many other goods and services likely to feature in digital advertising. Having limited funds to spend on data also means consumers might initially not use the Internet that much at all.

### **...as Africa advances into a new era of media consumption**

Irrespective of the economic factors, it's clear that the underlying value driver in emerging economies – as it has been in developed markets – is media consumption. Given consumers' unquenchable desire for media experiences, a virtuous circle emerges where the rising bandwidth, devices and content – including localised content – in ever more geographies help to drive each other upwards, creating increasing value on all sides. In regions such as Africa, the spark that truly ignites demand for bandwidth may well be live streaming of sports onto mobile handsets. The appetite for sports such as football is evident in any village in Africa when a FIFA World Cup or UEFA Champions League soccer game is broadcast, and people crowd around an available television set. So there's a huge demand for live sport, and when the infrastructure and services are in place to meet it, consumers will likely rush to adopt them.

In the meantime, infrastructure build-out is continuing. At the end of 2015, South Africa's fixed broadband penetration stood at 14.1%, or 1.5mn fixed broadband households. In contrast, mobile Internet penetration stood at 44.8%, with 75.4mn mobile Internet connections, projected to rise to 104.3mn in 2020. While growth will continue to be generated mainly from take-up of 3G services, the availability of 4G services and devices will increase towards the end of the forecast period, helping mobile Internet access revenue to rise at a CAGR of 12.1% over the five years to US\$4.76bn in 2020.

As Africa as a whole moves towards a future of richer and more ubiquitous media consumption enabled by broadband, a number of strategies have emerged to support progress. With a low installed base of home phones (let alone broadband), there's little legacy to replace, and some parts of Africa are leapfrogging straight from 1.5G to 5G. This makes mobile data services all the more important in people's lives, triggering movements such as the "Data Must Fall" campaign to bring data charges down. Local solutions have also emerged to overcome the current lack of bandwidth, such as selling smartphones complete with onboard FM radio receivers, and offering services where content is downloaded to the handset rather than streamed and is then erased after being consumed.

## **Developed markets follow different evolutionary paths**

As the growth opportunities continue in emerging markets, some developed markets stand out as leaders, further underlining the “world of differences” theme. For example, South Korea – a longstanding global pioneer and leader in digital connectivity – already has the second-highest mobile Internet penetration worldwide at 86.8%, and since 2014, 100% of the country’s fixed broadband connections have been in the high-speed bracket. As a result, South Korea is expected to get very close to 100% high-speed mobile penetration by 2020. Ultrafast connectivity of this sort enables operators in South Korea to offer next-generation services such as Ultra-High Definition (or 4K) IPTV, cloud, connected home and Internet of Things (IoT) services.

Not surprisingly, mobile Internet access in South Korea dominates overall spending on Internet access, with mobile’s share of total Internet access revenues set to rise from 57.2% in 2015 to 61.9% in 2020. This is in sharp contrast to the situation in Greece, where – unusually – fixed broadband continued to account for the majority of Internet access spending in 2015, and – even more remarkably – will still do so in 2020. While growth in mobile Internet access revenue in Greece is expected to outpace fixed broadband access through the forecast period, our projections suggest that fixed broadband access revenues – at US\$959mn in 2020 – will still be well ahead of Greece’s mobile Internet access revenues of US\$865mn in that year.

Singapore, meanwhile, is differentiated by having the highest current and future tablet penetration of any country in the world, reflecting its position as one of the most advanced Internet access markets. As at end-2015, 96.6% of Singapore’s fixed broadband households were in the high-speed bracket, a figure expected to be 100% by end-2016. Singapore’s mobile Internet market is similarly advanced and competitive, with all three operators in the country having rolled out nationwide LTE-Advanced coverage during 2015 and trialling variations of tri-band LTE-A. High-quality services will drive mobile Internet access revenue growth at a CAGR of 9.8% from US\$930mn to US\$1.49bn over the forecast period, with mobile Internet subscribers increasing from 4.4mn to 5.1mn.

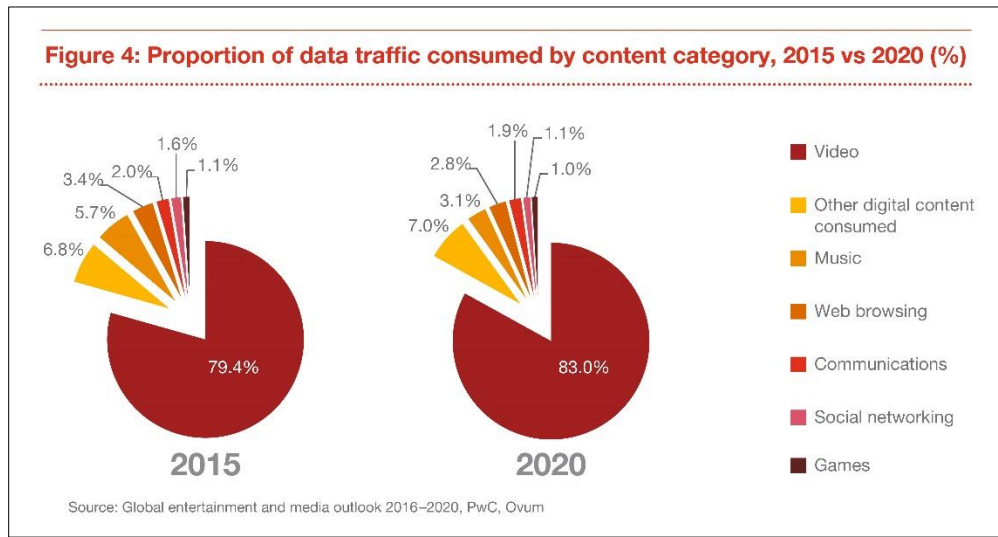
## **Looking forward: digital media plays a key role...**

Throughout the forecast period and beyond, partnerships between Internet access operators and companies that provide “over-the-top” (OTT) digital media services will play an increasingly important role in driving Internet access adoption and competition. For example, a major online social media and social networking company and leading internet services company are separately rolling out major initiatives that aim to “connect the unconnected” in emerging markets. The most significant aspects of these initiatives centre on convincing operators to allow consumers to access low-bandwidth versions of their services without incurring data charges. The two companies are also proposing to help extend broadband to areas currently without coverage by using drones, air balloons and other unconventional means.

Meanwhile, operators in developed markets are seeking to attract subscribers and grow ARPU by adding third-party online content and applications, such as music-streaming service and video on demand (VOD) offer, to their broadband bundles. A growing number of mobile operators are also offering customers the ability to access well-known online services at no extra charge or impact to their data allowance. Social media, messaging and video applications are the most popular focus areas for these partnerships.

## **...as mobile video comes of age – with AR, VR and MR as the next wave**

However, perhaps the most significant development for all participants in the Internet access value chain is that the age of mobile Internet video has truly arrived for consumers worldwide. In a recent survey by Ovum of 8,000 consumers across nine countries (covering North America, Europe, the Middle East and Asia Pacific), three in four respondents confirmed that the ability to watch videos on their mobile devices is important and impacts their customer satisfaction. Furthermore, 40% stated that they watch videos of at least 30 minutes in length on their smartphone.



The attitudes and behaviours illustrated in this analysis explain why video commands the greatest share of data traffic over mobile devices as well as fixed networks. Video is expected to comprise 83% of device-based data traffic in 2020 across the ten countries, up by four percentage points from 2015, as shown in Figure 3. Video's share of the market will grow across all networks, aided by the proliferation of 4G and large-screen smartphones. Again, the message is that people want video – and will continue to pay for devices and mobile Internet access to get it.

As traditional media continues to grow exponentially in developing economies, the next generation of high-bandwidth media consumption is taking shape in developed markets: dynamic and highly personal content generated artificially using virtual reality (VR), augmented reality (AR) and – ultimately – mixed reality (MR) headsets. As more AR/VR content becomes accessible, and headsets become both untethered and more affordable, AR/VR will hit the mainstream in developed markets within the next three to five years, with developing nations following a further three to five years later. Given capabilities such as choosing the seat in the ground from which to experience a live football match, it's clear these technologies also bring disruptive implications for established content formats. With content management platforms already being developed for VR/AR content, the stage is set for the next wave – enabled and supported by rising broadband capacity.

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## **Global entertainment and media outlook**

*PwC's Global entertainment and media outlook 2016-2020 provides a single comparable source of five-year forecast and five-year historic consumer and advertiser spending data and analysis, for 13 entertainment and media segments, across 54 countries. It's a powerful online tool that provides deep knowledge and actionable insights about the trends that are shaping the E&M industry. Subscribe to the Global entertainment and media outlook at [www.pwc.com/outlook](http://www.pwc.com/outlook)*

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