THE GLOBAL PAY-TV INNOVATION LANDSCAPE:

INDUSTRY PERSPECTIVES ON CHALLENGES AND OPPORTUNITIES

WHITE PAPER - SEPTEMBER 2016

NAGRA, the digital TV division of the Kudelski Group (SIX:KUD.S), provides security and multiscreen user experience solutions for the monetisation of digital media. The company offers content providers and DTV operators worldwide secure, open, integrated platforms and applications over broadcast, broadband and mobile platforms, enabling compelling and personalised viewing experiences.

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INTRODUCTION

The Pay-TV Innovation Forum is a new global research programme for senior pay-TV executives, developed by NAGRA to explore and catalyse innovation across the pay-TV industry at a time of unprecedented change.

This report summarises the findings from the 2016 programme of research and analysis, providing an overview of the pay-TV innovation landscape and setting out the views of industry executives around the world – in Europe, Asia Pacific, Latin America and North America. It provides a snapshot of industry perspectives about the innovation challenges and opportunities facing the industry and outlines a set of innovation priorities for the pay-TV operators.

What do we mean by innovation? Innovation can be defined in various ways: it can encompass improvements to internal business processes, incremental extensions to existing products and services, and new business models. Although all of these are important, our focus is narrower – on the **creation of viable new customer-facing products and services that can deliver value to the pay-TV enterprise.**

The findings in this report were developed between March and September 2016 and are based on MTM research and analysis and extensive engagement with pay-TV industry executives from around the world. Unless otherwise attributed, all quotations used in the report come either from in-depth interviews or seminars with senior pay-TV industry executives held across the four regions. All sessions were completed under the Chatham House Rule (no attribution without prior permission), with participants speaking as individuals and not as company representatives. Inevitably, this paper provides only a partial view of a highly complex industry: it represents a snapshot of industry perspectives at a particular moment in time.

MTM and NAGRA would like to thank all those who have contributed to the research for their input and insights:

Europe, the Middle East and Africa

Asia Pacific

North America

Latin America

The opinions expressed in this paper are solely those of the authors and reflect MTM's judgement at the time of writing, based upon the available information. These views do not necessarily represent the views of the interviewees and contributors. Any errors or mistakes are entirely the responsibility of the project team.

EXECUTIVE SUMMARY

HOW INNOVATIVE IS THE PAY-TV INDUSTRY AND WHO ARE TODAY'S INNOVATION LEADERS? WHAT CHARACTERISTICS AND CAPABILITIES DISTINGUISH THE INDUSTRY'S INNOVATION LEADERS? WHAT OPPORTUNITIES ARE OPENING UP FOR PROVIDERS AND WHAT STEPS SHOULD THEY TAKE TO PURSUE THEM?

The pay-TV industry is a global success story, exceeding a billion subscribers and US$200 billion in global revenues earlier this decade and widely expected to reach US$250 billion in global industry revenues by 2020. The industry has driven innovation in TV markets round the world, providing additional choice flexibility for consumers and supporting investment in content and advanced new services.

Historically, pay-TV providers pursued a distinctive business model, characterised by investment in end-to-end distribution platforms and consumer-premises equipment, content aggregation and packaging, and the acquisition and management of subscribers. This model worked well for many years and provided successful providers with significant competitive advantages.

However, it also had important limitations – pay-TV platforms were expensive to build, maintain and upgrade, were geographically constrained, often to a very limited footprint, and were often very inflexible. Few operators maintained large in-house innovation or R&D functions, with most leaning heavily on their technology suppliers.

Today, the industry is experiencing a period of change and disruption, with operators in many markets facing a perfect storm of slowing growth, intensifying competition and business model disruption. New entrants – telcos and OTT providers – have intensified competition in many markets, while the deployment of advanced broadband networks has eroded many of the traditional competitive advantages enjoyed by pay-TV providers.

Although these changes are unevenly distributed internationally, most industry executives believe that innovation is becoming ever more important to the pay-TV industry, as providers look to drive future growth, remain competitive and satisfy the increasing expectations of customers and investors. At the same time, opportunities to innovate are proliferating and becoming more accessible to many operators: TV platforms are becoming more flexible and capable, advances in broadband are creating opportunities to extend services beyond traditional operator footprints, and there are new opportunities to partner with technology providers and suppliers.

However, innovation remains challenging for many pay-TV businesses, with executives citing a lack of skills, difficulties measuring ROI, and corporate risk avoidance as important barriers. Today, the most advanced portfolios are generally offered by major pay-TV operators and telcos in North America (AT&T / DIRECTV, Comcast Cable, DISH Network, Rogers, Time Warner Cable, and Verizon), Europe (Deutsche Telekom and Sky), and Asia Pacific (StarHub). However, nearly all providers are well advanced in deploying advanced functionalities on their core TV platforms and providing advanced multi-platform services, but only a small number of large-scale providers, generally operating in larger, wealthier markets, are currently addressing significant business adjacencies, such as advanced advertising, IOT and technology licensing.

Looking forward, the majority of executives believe that their innovation priority is to evolve the core pay-TV offer, developing new ways to price and package content, bringing new kinds of content onto their TV platforms, and continuing to invest in multiscreen TV everywhere offerings. Other areas appear less commercially attractive, although over half of executives see attractive opportunities in advanced advertising and data.

To deliver against these opportunities, operators need to address four main innovation priorities:

Exhibit 1: Innovation priorities for pay-TV service providers

Establish strong customer and market insight capabilities

Continue to deploy platforms and processes that can support faster innovation

Develop strategic partnerships with best-of-breed technology suppliers and start-ups

Build collaborative partnerships with content companies to unlock new commercial opportunities

1 — THE PAY-TV LANDSCAPE TODAY

In many respects, the pay-TV industry is a global success story. It has experienced a long period of sustained growth and development around the world, exceeding a billion subscribers and US$200 billion in global revenues earlier this decade; and is widely expected to reach US$250 billion in global industry revenues by 2020.

Historically, pay-TV providers have pursued a distinctive business model, characterised by investment in end-to-end distribution platforms, set-top boxes in consumer households, and sophisticated conditional access systems. Most providers licensed content from third-party providers – multichannel broadcasters and studios – and charged households a monthly subscription fee for access to service bundles. Revenues were shared with content providers, often on a per-subscriber basis. In some cases, providers also captured a share of the advertising revenues generated by channels. Providers were generally restricted by their platforms to delivering their services within a particular geographic footprint; and tended to build their businesses within these territories, securing content rights and establishing operations to serve a specific region or territory.

For many years, this traditional pay-TV business model has worked well, providing successful operators with long-term competitive advantages that have protected their profits and market share from competing firms.

However, the traditional model has also shown significant limitations. Pay-TV platforms were expensive to build, maintain and upgrade, with operators devoting considerable resources to keeping their platforms up to date, as new technologies have entered the market. The challenges involved in keeping platforms up-to-date have differed between satellite, cable and IPTV-based systems. Many satellite pay-TV businesses scaled quickly, supported by the immediate high reach that satellite provides.

> **57%** OF EXECUTIVES AGREE THAT *"PAY-TV SERVICE PROVIDERS IN THEIR COUNTRY WILL STRUGGLE TO GROW THEIR BUSINESSES OVER THE NEXT 5 YEARS."*[1]

However, they have had to invest to develop a return path to connect their set-top boxes to the internet. Cable operators vary considerably in size, with smaller businesses lacking the resource to keep their platforms up-to-date. IPTV providers are future-proof insofar as they operate two-way IP networks, but many of them came late to market, in some cases acquiring lower-value customers than their rivals.

The geographic footprints of operators have been another important constraint, limiting the ability of all but the largest operators to realise economies of scope and scale and constraining operator investment in R&D and innovation: ***"We make money by retailing products to subscribers in our footprint. This means there's a limit on how much money we can invest in R&D – our footprint isn't that big, which limits our ability to make a return. We're not like an Apple or a Google or a Netflix, who can market their products to consumers all around the world. They can afford to spend huge amounts on developing new products for global consumers."***

As a result, very few pay-TV operators have historically maintained large in-house innovation or R&D functions. Instead, operators have tended to lean strongly on their technology suppliers to support their innovation efforts, supported by in-house teams, with the largest pay-TV businesses occasionally making acquisitions or taking stakes in providers to secure access to key technologies.

Operators have also tended to rely on third-party broadcasters and studios to provide almost all their programming, with content providers often securing multi-year agreements with annual price increases far in excess of the rate of inflation. Not surprisingly, content costs are the largest single expense for many pay-TV providers and have generally been increasing. However, removing programming from platforms and passing price rises on to consumers has often proven difficult, resulting in dissatisfied customers and increased churn. Moreover, content providers have typically provided only limited grants of rights. This has restricted the ability of operators to develop innovative new video products, forcing them to secure additional rights, often at considerable expense.

Today, the industry's traditional competitive advantages are starting to erode, especially in more advanced markets. Pay-TV providers are experiencing a period of dramatic change, with operators in many markets facing a perfect storm of slowing growth, intensifying competition and business model disruption. During the last ten years, broadband

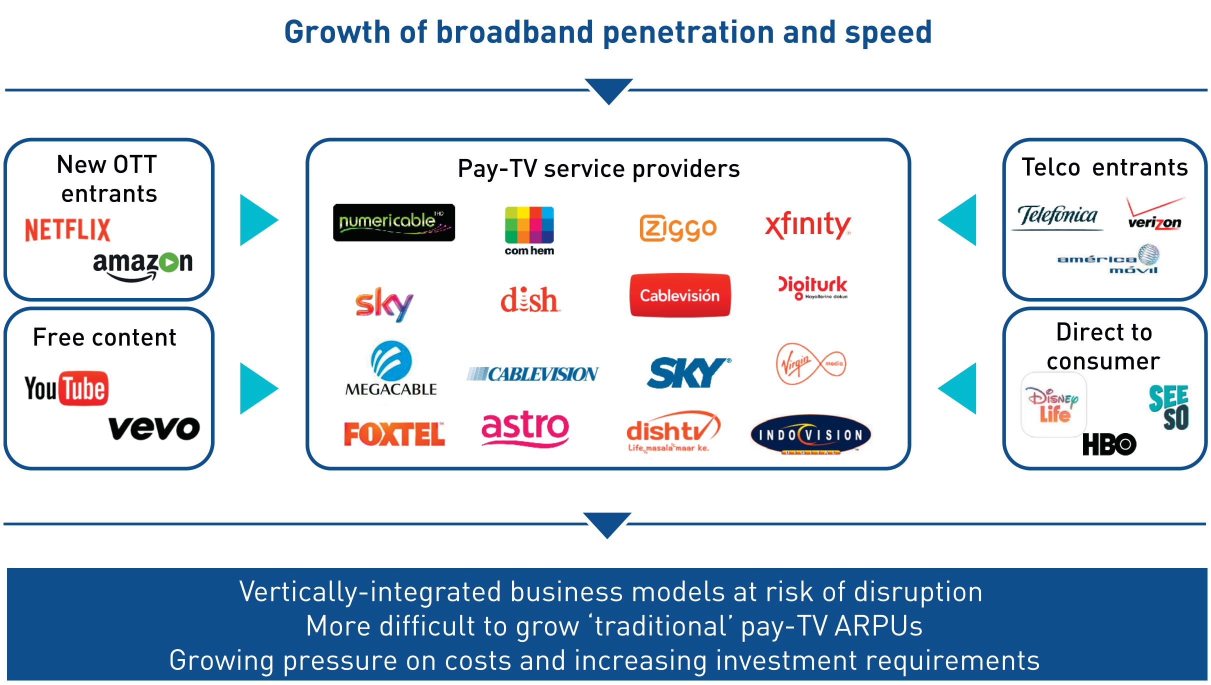
[1] Question: Thinking about developments affecting pay-TV industry revenues in your country through to 2020, how much do you agree or disagree with the following statements? (% of respondents indicating "strongly agree" or "agree"; n = 92)

quality and availability have steadily improved in many markets, providing consumers with access to a much wider range of video content and allowing new OTT entrants to retail premium TV and film content directly to consumers: *"The pay-TV and video verticals are going through a period of change, driven primarily by shifts in delivery mechanism, viewer behaviour and types of content. Video content can now be easily delivered over any broadband connection and does not require proprietary networks. Viewers are embracing on-demand viewing and millennials - the future target buyers of pay-TV services - are viewing new types of digital-first content that historically have not been part of a pay-TV proposition."*

Major telcos have aggressively entered the pay-TV market, capitalising on the expanding capabilities of their networks to offer video content to their customers and leveraging their strong cash flows to build or buy market share. In some markets, OTT streaming devices are rapidly gaining traction, putting pressure on prices and introducing new functionalities such as voice control and 'casting'. Meanwhile, leading content and channel providers, once exclusive providers to the pay-TV industry, have begun developing their own direct-to-consumer OTT businesses, while also capturing a greater share of the value created by the pay-TV industry as competition for the most attractive rights intensifies (See Exhibit 2).

> **71%** OF EXECUTIVES AGREE THAT *"COMPETITION FOR PREMIUM FILM, TV AND SPORTS CONTENT WILL INTENSIFY DRAMATICALLY, WITH A GREATER NUMBER OF COMPANIES SEEKING TO ACQUIRE THE MOST ATTRACTIVE RIGHTS."*[2]

Exhibit 2: Drivers of change in the pay-TV industry



[2] Question: Thinking about developments affecting pay-TV industry revenues in your country through to 2020, how much do you agree or disagree with the following statements? (% of respondents indicating "strongly agree" or "agree"; n = 92)

It is easy to overstate the impact of these developments, which are unevenly distributed across different geographies, and which are at a relatively early stage in many markets. Around the world, pay-TV remains robust and often highly profitable, and many pay-TV providers have responded to increased competition by expanding into telecoms markets, scaling up their investments in content, developing multiscreen and standalone OTT offerings, and offering adjacent services, such as advanced advertising and data analytics.

Moreover, many pay-TV providers have made significant headway in migrating to more advanced technology platforms, embracing the shift from hardware to software-defined platforms and networks, deploying hybrid, heterogeneous networks, and adopting virtualised solutions. Seamless connectivity between devices, unified service creation and management, customer-centricity and agile development are increasingly common across the industry.

Despite these positive developments, many industry executives believe that the industry is going through a period of disruption, with the traditional vertically-integrated pay-TV business model becoming more challenging as consumers gain access to a far greater diversity of services. As one senior executive told us, *"OTT is still only a relatively small proportion of viewing and industry revenues, but it has the potential to be very disruptive. It appeals to the most valuable customers and is challenging consumer expectations about what a good service offers and how it's priced. In 2005, our main competitor was free-to-air TV, but now it is telcos and OTT offerings. There's no doubt that the pay-TV industry is in a more disruptive phase today than it was ten years ago, and the rate of change is only going to accelerate, as these changes intensify."*

63% OF EXECUTIVES DISAGREE THAT *"AVERAGE REVENUES PER SUBSCRIBER FOR THE MAJOR PAY-TV SERVICE PROVIDERS WILL GROW STRONGLY FROM CURRENT LEVELS"*[3]

In addition, pay-TV service providers now operate in a significantly more complex environment, delivering multiple types of content and services across a growing range of consumer devices: *"Ten years ago the subscriber of a pay-TV product was the family household. Today, the picture is very different - there might be five members of that household, each of them looking for different content. The 'one subscription fits all' model does not work anymore. We are now switching our focus to building an ecosystem of products and services that appeals to each member of the household."*

[3] Question: Thinking about developments affecting pay-TV industry revenues in your country through to 2020, how much do you agree or disagree with the following statements? (% of respondents indicating "strongly agree" or "agree"; n = 92)

GROWING IMPORTANCE AND URGENCY TO INNOVATE

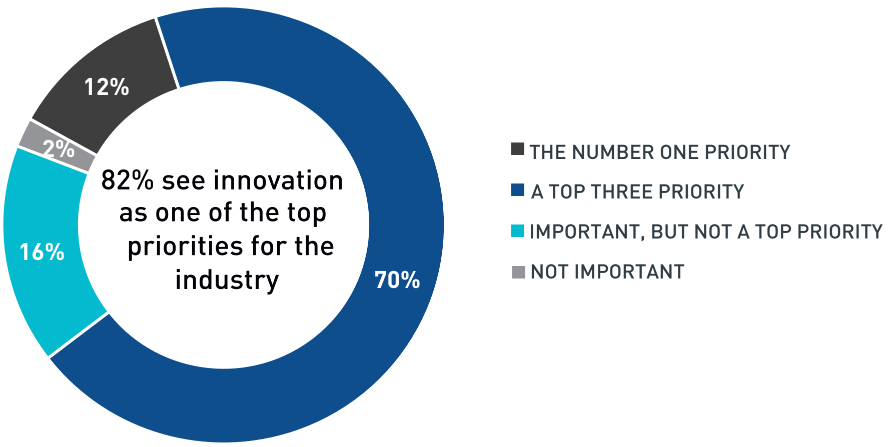
As growth becomes more challenging and competition intensifies, innovation is becoming ever more important to the pay-TV industry, as providers look to drive future growth, remain competitive and satisfy the increasing expectations of customers and investors. The industry no longer enjoys a monopoly on the provision of premium film and TV services, with industry shifts making it increasingly challenging for pay-TV providers to be a one-stop shop for TV services. The imperative to innovate is becoming more intense.

78% OF EXECUTIVES AGREE THAT *"TO GROW, PAY-TV SERVICE PROVIDERS WILL HAVE TO INNOVATE STRONGLY OVER THE NEXT 5 YEARS."*[4]

Innovation can be defined in various ways – and is often criticised as being too broad a term to be truly useful. It can encompass improvements to internal business processes, incremental extensions to existing products and services, and new business models. Although all of these are important, our focus is narrower – on the creation of viable new customer-facing products and services that can deliver value to the pay-TV enterprise. In this sense, innovations may be new to the market or industry, but they may also be evolutionary, based on previous advances and existing offerings. Innovation may involve invention, but successful innovation requires other elements too, such as anticipating, testing and exploring demand, the development of viable commercial propositions, and good partnering skills.[5]

Perhaps unsurprisingly, there is a strong consensus that innovation is becoming more important and more urgent for the pay-TV industry, with 82% of executives considering it to be one of the top three strategic priorities for the industry (See Exhibit 3).

Exhibit 3: The majority of industry executives regard innovation as one of the top three strategic priorities[6]



[4] Question: To what extent do you agree or disagree with the following statements about innovation and the pay-TV industry? (% of respondents indicating "strongly agree" or "agree"; n = 92)

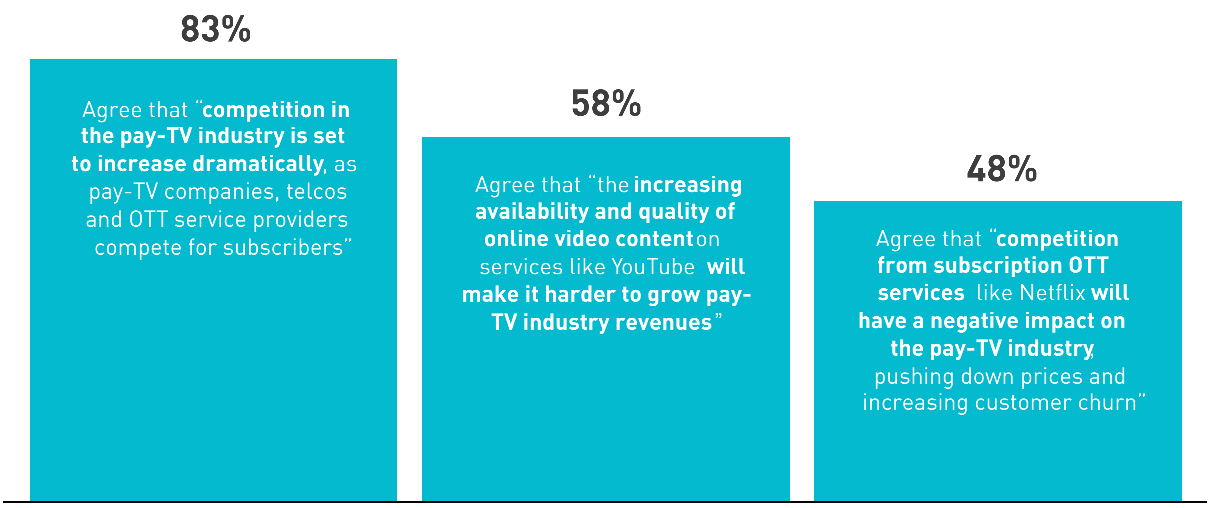
[5] Larry Keeley, Ten Types of Innovation (2013) and Alexander Osterwalder, Business Model Generation (2010)

[6] Question: Where does innovation rank among the pay-TV industry's top strategic priorities? (n = 92)

Industry executives commonly cite three inter-related factors driving the growing importance and urgency for pay-TV companies to innovate:

Operators face a growing threat of disruptive competition. Pay-TV industry executives across the world believe that competition in the provision of paid-for video services has become more intense, as broadband coverage, penetration and quality have improved (See Exhibit 4). Importantly, growing competition is being driven by well-funded businesses with the potential to disrupt established business models and innovate at scale – telcos, major internet businesses and technology providers, and multinational media and entertainment conglomerates: *"If you're the market leader in pay-TV, you don't want to be the next Kodak, you have to innovate. It's about having a sustainable business model – the world is changing more rapidly than ever before, traditional models are going up in the air. Innovation is crucial – how else do you figure out a sustainable model?"*

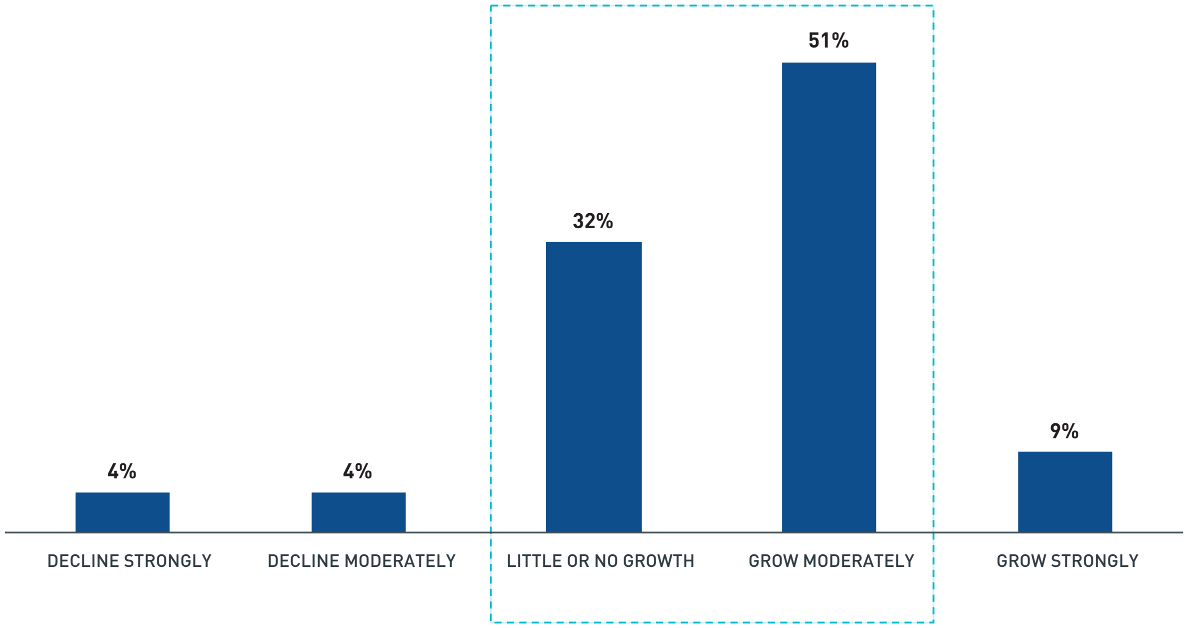
Exhibit 4: Competition in and around the pay-TV industry is expected to increase[7]



Growth in traditional pay-TV revenues is slowing in many markets. - In some territories, growth in 'traditional' pay-TV revenues has slowed markedly as markets have matured and low-cost offerings have proliferated, forcing providers to develop new products and services to drive future growth in ARPU (See Exhibit 5, overleaf). *"We're in the 'innovate or die' stage of the cycle. For a long time, the pay-TV industry enjoyed a golden age, in terms of its business model, being able to collect huge subscription revenues for big premium channel bundles. But this model is now under attack, subscriber numbers are going down and premium TV margins are being squeezed. Pay-TV providers need to innovate fast."*

[7] Question: Thinking about developments affecting pay-TV industry revenues in your country through to 2020, how much do you agree or disagree with the following statements? (% of respondents indicating "strongly agree" or "agree"; n = 92)

Exhibit 5: Little or moderate growth expected in the pay-TV industry through to 2020 [8]



Consumers increasingly expect innovative new video features and products.

As internet penetration and usage have grown, consumer expectations about video services are shifting, as users become accustomed to features and functionalities such as personalisation, multi-platform viewing and recommendations. Pay-TV providers are having to innovate to meet these expectations and to remain competitive: *"New customer expectations in terms of content, functionality and price are a big driver of innovation in pay-TV. I don't believe pay-TV service providers will continue to offer the same set of services over the next five years. Customer journeys are changing every year and pay-TV services need to change in line with that."*

However, perspectives on the importance of innovation vary strongly, by market and region. Service providers operating in wealthy, mature, and highly competitive pay-TV markets have a significantly stronger incentive to innovate compared to those in less developed markets. In these markets – where consumers have limited purchasing power, broadband and pay-TV penetration is low, and service providers face little competitive pressure – the key priority is to grow penetration by rolling out existing broadband and pay-TV products to a broader customer base rather than to develop new products and features. In addition, the importance of pay-TV innovation tends to be shaped by the wider portfolio of products and services. Service providers that offer triple- or quad-play services have more 'degrees of freedom' to innovate across their portfolio, with some of them focusing on innovation in other areas, such as broadband or mobile, rather than pay-TV.

[8] Question: Which of the following statements best describes your opinion about the growth prospects for the pay-TV industry in your country through to 2020? (n = 92)

OPPORTUNITIES TO INNOVATE ARE PROLIFERATING AND BECOMING MORE ACCESSIBLE TO OPERATORS

Innovation is not just becoming more important and urgent for the pay-TV industry - it is also becoming significantly more achievable: *"There are lots of opportunities for us to innovate – and we're well-positioned to deliver them. We've got a good track record and have lots of valuable assets and experience – and leaders who want us to innovate."*

Investments in advanced platforms and networks are creating a wide range of new innovation opportunities. A growing number of service providers are migrating from inflexible hardware-based legacy TV platforms to more flexible, software-based solutions. They are virtualising certain processes, including set-top box functionality in some cases, and moving these from hardware into a cloud environment. Consequently, it is becoming easier to innovate and launch new services and functionalities: *"In order to be competitive, we are moving away from a large number of different technology platforms across our footprint towards a consolidated technology architecture that would support quick and cost-effective development of new products and features."*

Broadband delivery is creating new opportunities to deliver new products and services. Historically, pay-TV service providers have been constrained by their geographical footprints. However, as broadband connectivity improves, they can increasingly deliver products and services to wider audiences, over the internet. The most advanced service providers are already aggressively launching standalone OTT offerings that target specific groups of consumers with innovative offerings, such as skinny bundles and mobile-first services (e.g. Sky's Now TV or Verizon's go90).

Industry consolidation is creating innovation powerhouses. The pay-TV industry is going through a wave of consolidation, creating a small number of larger-scale service providers with the reach and resources to pursue new innovation opportunities. In some cases, these large service providers are establishing centralised innovation hubs and centres of excellence (e.g. Telefonica's Global Video Unit, Comcast's Innovation and Technology Centre) to support on-going innovation across their customer footprints. Some of the largest service providers have also developed corporate venturing programmes (e.g. Sky's Startup Investments & Partnerships programme, which led to Sky taking stakes in companies like Pluto.TV and DataXu) to take stakes in high-growth, innovative product and service companies – securing a pipeline of innovations that they can bring to their own platforms and grow by leveraging their scale and capabilities.

Pay-TV service providers have the expertise to develop new appealing video products and services. The leading pay-TV service providers are experts in video content, content delivery technology, product development, branding, marketing, and customer service. In many respects, they are uniquely well-positioned to innovate and grow.

INNOVATION AREAS

Over the years, pay-TV service providers have innovated and developed their portfolios to encompass a variety of products and services. Today, pay-TV operator innovation efforts are generally focused on evolving the core pay-TV offer – the pay-TV platform and off-platform online services, such as TV Everywhere offerings and apps – and on developing adjacencies, products and services targeted at nearby markets, leveraging existing assets, capabilities and relationships to develop new commercial offerings.

Exhibit 6: Pay-TV service providers innovate in the following product and service areas

The core pay-TV offer

Pay-TV service providers have been successful in developing their core pay-TV propositions, extending them beyond the 'traditional' end-to-end TV platform and offering multi-platform products and services. Today, pay-TV executives identify six main areas of innovation opportunity for their core pay-TV products and services:

1. **New ways to price and package content.** Pay-TV service providers are evolving their pricing and packaging to adapt to changes in consumer preferences and competitive environment by introducing more flexible and affordable options, such as skinny bundles, *à la carte* pricing, daily passes, and contract-free subscriptions.

2. **Advanced functionality.** Service providers are leveraging IP connectivity and next-generation set-top boxes to introduce more sophisticated features and functionalities, such as network digital video recorders, voice control, personalised content recommendations, and 4K video quality.

3. **New types of content offering.** Emergence of new types of content and IP connectivity are enabling service providers to offer these types of content on their platforms. These include on-boarding of third-party content (integrating third-party OTT services and applications, such as Netflix or Facebook, onto their set-top boxes) as well as virtual reality and gaming.

4. **Standalone OTT.** Many leading service providers are developing their own standalone OTT subscription or ad-funded services in order to expand their footprint and target new customer groups. These new services are often developed as complements rather than substitutes for the existing pay-TV offerings, but many providers still struggle to build robust business cases for them.

5. **Multiscreen TV Everywhere.** Many service providers have developed multiscreen TV Everywhere offerings that allow their subscribers to access live and on-demand video content on a variety of portable devices. Executives see these services as an integral part of next-generation multiscreen pay-TV experiences.

6. **App-based pay-TV.** With a growing number of app-based OTT video services and devices that support them, pay-TV service providers are also exploring opportunities to offer similar services, which would not require a proprietary set-top box, allowing pay-TV services to be delivered through applications on Smart TVs and other devices.

Adjacencies

Growth outside the core, expanding into new categories and adjacencies, is a hallmark of many of the pay-TV industry's innovation leaders. Leveraging existing assets, capabilities and relationships to develop new products and pursue new opportunities can deliver highly profitable growth – an important priority for pay-TV providers operating in mature, competitive markets and facing significant disruption from online video and OTT businesses.

Although there are a wide range of potential adjacencies, providers are currently focusing on three main innovation opportunities:

1. **Advanced advertising and data.** TV platforms increasingly support new forms of targeted advertising and dynamic ad insertion and provide valuable data about TV viewing. The most advanced operators are extending these capabilities to their OTT offerings, developing new ways of targeting ads across different devices and platforms.

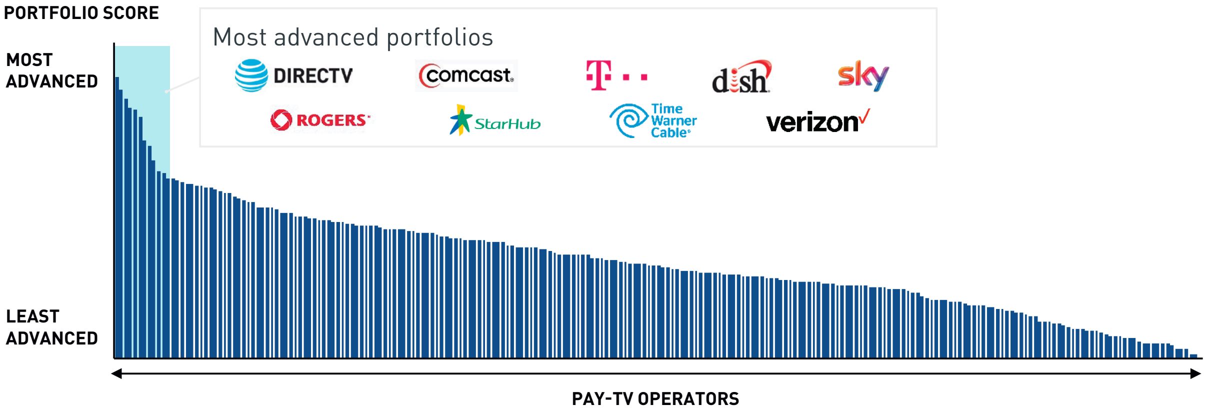
2. **Internet of Things (IoT) and Smart Home solutions.** Connected home revenues and IoT offerings are forecast to grow rapidly during the next decade, creating opportunities for pay-TV providers to evolve set-top boxes into connected home gateways – service hubs for in-home IoT offerings that support new device ecosystems. Potential applications include home security, monitoring, automation and integration of entertainment applications.

3. **Content and technology services.** Many pay-TV providers provide B2B services to channel partners and have developed products and technical solutions that can potentially be provided or licensed off-platform. For telcos, these offerings are often a natural extension of existing business services, with pay-TV providers increasingly looking to develop similar capabilities. Similarly, more and more providers are showing interest in licensing or white-labelling their technical solutions, helping to amortise development costs beyond their footprint or to share costs with other providers.

   Despite high levels of interest, adjacent growth is challenging, even for the largest operators. New offerings are often a poor fit with existing pay-TV businesses in terms of culture, capabilities and systems, requiring considerable investment. There are few easy adjacencies – most markets are either competitive and crowded or early-stage and relatively high-risk.

So, what is the state of innovation across the pay-TV industry today? Pay-TV service providers are at varying stages of developing and diversifying their product portfolios, ranging from: highly advanced portfolios, mainly offered by major pay-TV operators and telcos in North America (AT&T / DIRECTV, Comcast Cable, DISH Network, Rogers, Time Warner Cable, and Verizon), Europe (Deutsche Telekom and Sky), and Asia Pacific (StarHub); down to the very basic service offerings, usually offered by small-scale local pay-TV operators and, in some cases, major pay-TV operators in emerging markets, such as India (See Exhibit 7).

Exhibit 7: The most advanced portfolios tend to be offered by major pay-TV operators and telcos[10]



Industry executives consider Sky and Comcast to be the most innovative pay-TV companies in the market today – both companies are large-scale enterprises who have invested heavily in new products and services, including advanced set-top boxes, OTT services and adjacent businesses. However, as many as 20% of industry executives who responded to our survey regard Netflix as the most innovative company in the pay-TV industry. Although Netflix is not a 'traditional' pay-TV business, it is considered to be an important part of the pay-TV ecosystem, which has driven significant change and innovation in the industry over the last couple of years (See Exhibit 8, overleaf):

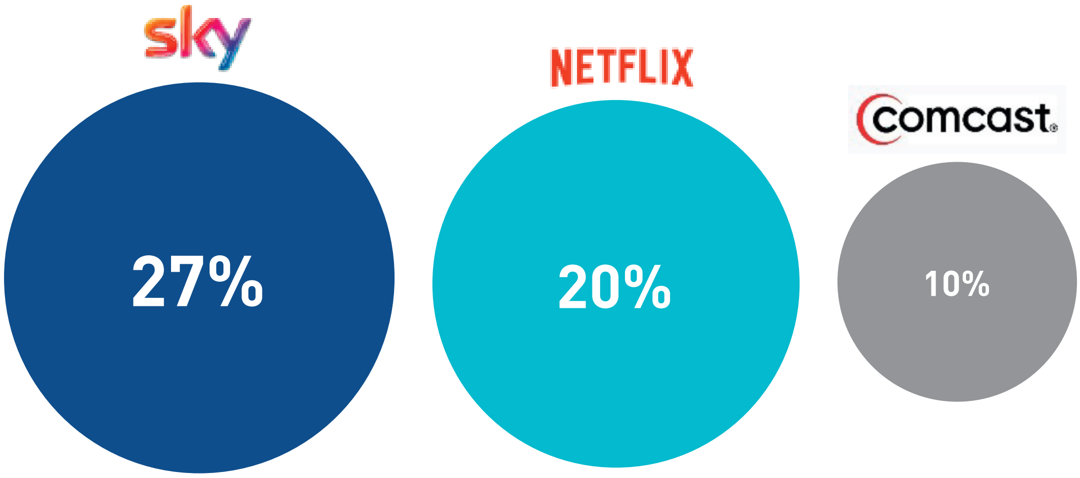
+ *"Netflix has changed the way people watch TV. If you look at the last 10 years, most of the innovation in the pay-TV industry was related to image quality and giving customers some on-demand content, such as DVR or VOD. What Netflix did was a big breakthrough – it allows everyone to get high-quality video over any broadband connection and any device."*

+ *"Netflix has been the most innovative service, both in terms of technology and business model. It seems that before Netflix, the pay-TV industry was a bit like the car industry trying to build their own roads for their own cars. Netflix showed us that it does not need to be the case."*

[9] We have conducted a detailed review of 231 pay-TV service providers' product and service portfolios across Asia Pacific, EMEA, Latin America, and North America, scoring them based on how advanced their offerings are. A detailed description of the methodology is provided in Section 9

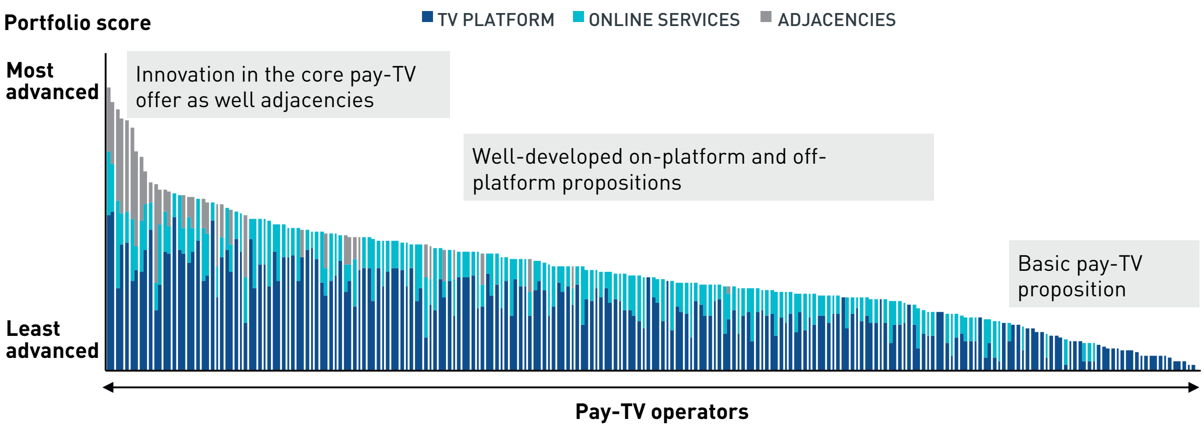
[10] Portfolio rankings by innovation score; Base: Pay-TV service providers in Asia Pacific, EMEA, Latin America, and North America (n = 231)

Exhibit 8: Sky, Netflix, and Comcast are cited as the most innovative companies in the pay-TV industry[11]



The majority of pay-TV service providers have evolved their core TV platform and moved into online services. However, adjacency diversification is less common, usually limited to a small set of innovation leaders (See Exhibit 9).

Exhibit 9: Pay-TV providers are improving their TV platforms and moving strongly into online services[12]



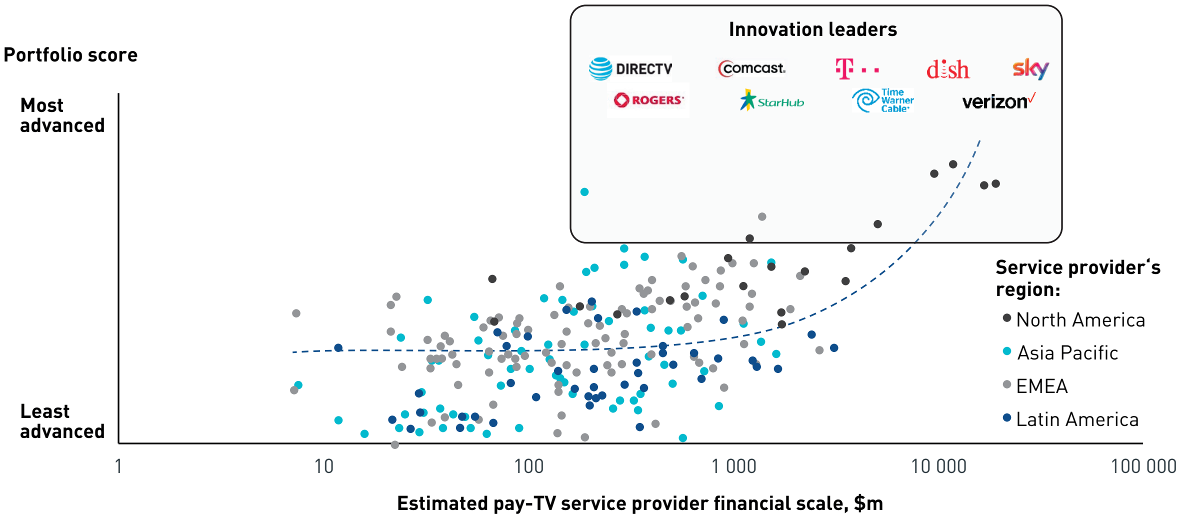
[11]Question: Today, who do you regard as the most innovative company in the pay-TV industry? (n = 92)

[12]Portfolio rankings by innovation score; Base: Pay-TV service providers in Asia Pacific, EMEA, Latin America, and North America (n = 231)

What are the key factors underpinning the most diverse portfolios? Perhaps unsurprisingly, our research suggests that both internal capabilities and external economic incentives are critical.

1. **Service provider's scale, resources, and capabilities.** In general, the most innovative pay-TV providers tend to be major enterprises with large subscriber bases or customer footprints, access to funding, and substantial in-house technology resources, often working closely in strategic partnerships with technology suppliers[13]. External factors appear equally important, in providing the right incentives to innovate – market characteristics such as consumer wealth and purchasing power, broadband penetration and quality, the regulatory environment, levels of pay-TV penetration and the competitive environment. Providers offering a portfolio of 'n-play' services, including broadband and telephony, alongside pay-TV, have scope for innovation in pricing and packaging of bundles. Providers deploying flexible technology platforms are able to develop new products more quickly than those relying on legacy hardware and software.

Exhibit 10: Scale is a key enabler of innovation in the pay-TV industry[14]



2. **Market enablers.** These include market-dependent features such as consumer wealth and purchasing power, technology advancement, regulatory environment, the size and growth trajectory of the pay-TV sector, the level of competition, and consumer expectations. Pay-TV service providers operating in highly populous, high income markets tend to have the largest addressable opportunities, while those operating in competitive markets have the strongest incentives for innovation.

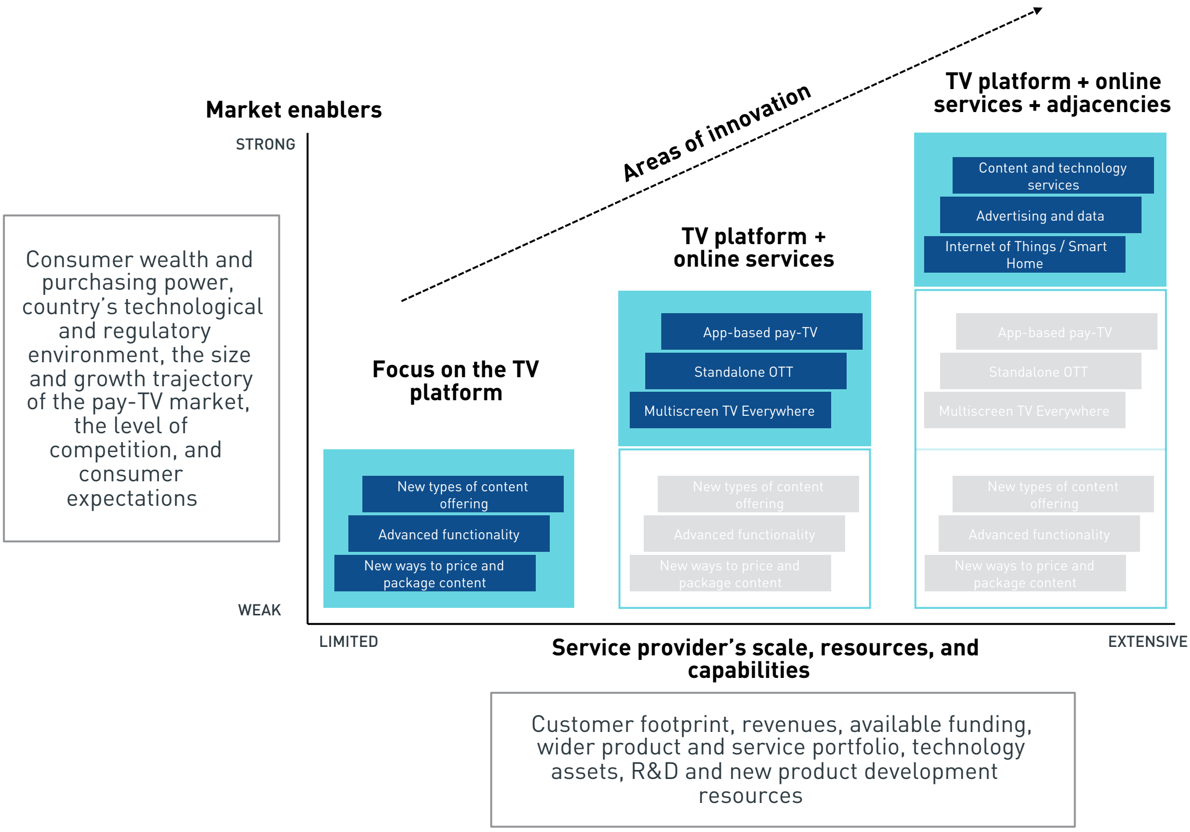
[13]Some of the most innovative operators are major telcos who have cross-subsidised their pay-TV offerings, developing advanced offerings that leverage their broadband networks.

[14]Pay-TV service provider financial scale is calculated as the product of total pay-TV industry revenues in a given country and service provider's share of pay-TV subscriber base in that country; Base: Pay-TV service providers in Asia Pacific, EMEA, Latin America, and North America (n = 231)

As legacy pay-TV platforms have been upgraded, innovation has become much more accessible, even for smaller operators. Today, advanced features and functionalities such IP connectivity and on-board OTT offerings are relatively common across pay-TV markets around the world.

However, the development and provision of online services, such as standalone OTT offerings, can be more challenging. On the one hand, launching standalone OTT services requires completely new sets of development resources and capabilities; while on the other, their success is highly dependent on market characteristics such as fixed broadband penetration and speed, consumers' willingness to pay, and availability of alternative services.

Exhibit 11: Areas of innovation are shaped by service provider's scale and market characteristics

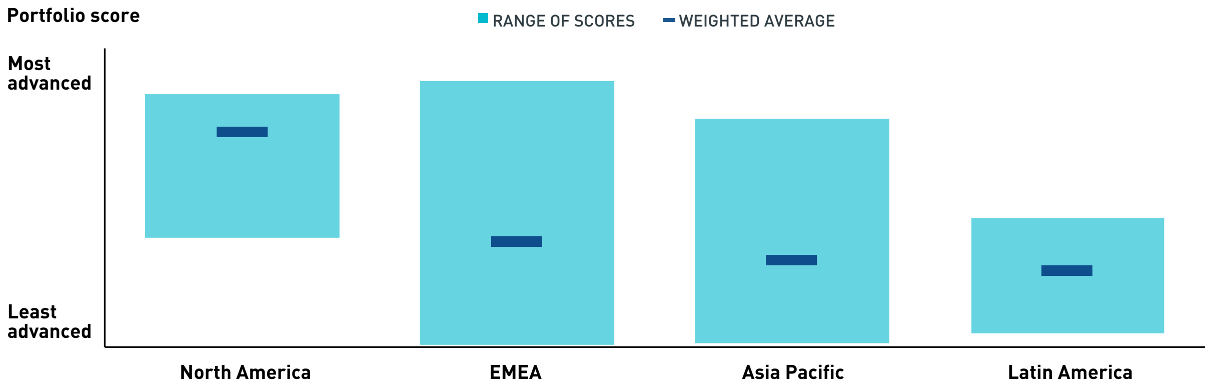


Diversification into adjacencies can be more challenging still, requiring both significant resources and favourable market conditions. For instance, dynamic ad insertion requires complex systems integration capability and is feasible only in markets where TV platforms control advertising inventory. Smart Home solutions require competence in developing IoT services and tend to be developed by large telcos that own network infrastructure, have large-scale consumer businesses, and have relevant R&D capabilities.

How does the state of pay-TV innovation vary by region? North American pay-TV service providers are notable for their innovation capabilities, offering the most advanced and diversified product and service portfolios. This position has been bolstered by factors including: high purchasing power and strong consumer appetite for state-of-the-art pay-TV services; high pay-TV and broadband penetration; large, high-value consumer footprints that support significant R&D and new product development budgets; and growing competition in the market.

By contrast, pay-TV markets in EMEA and Asia Pacific are much more fragmented, with market characteristics and service-providers' innovation capabilities varying substantially by territory. At the lower end of the spectrum, Latin American players lag behind their counterparts in other regions due to low purchasing power and high levels of income inequality, poor fixed broadband infrastructure, and easy access to free high-quality alternatives, such as free-to-air TV and pirated content (See Exhibit 12).

Exhibit 12: North American pay-TV service providers offer the most advanced product and service portfolios[15]

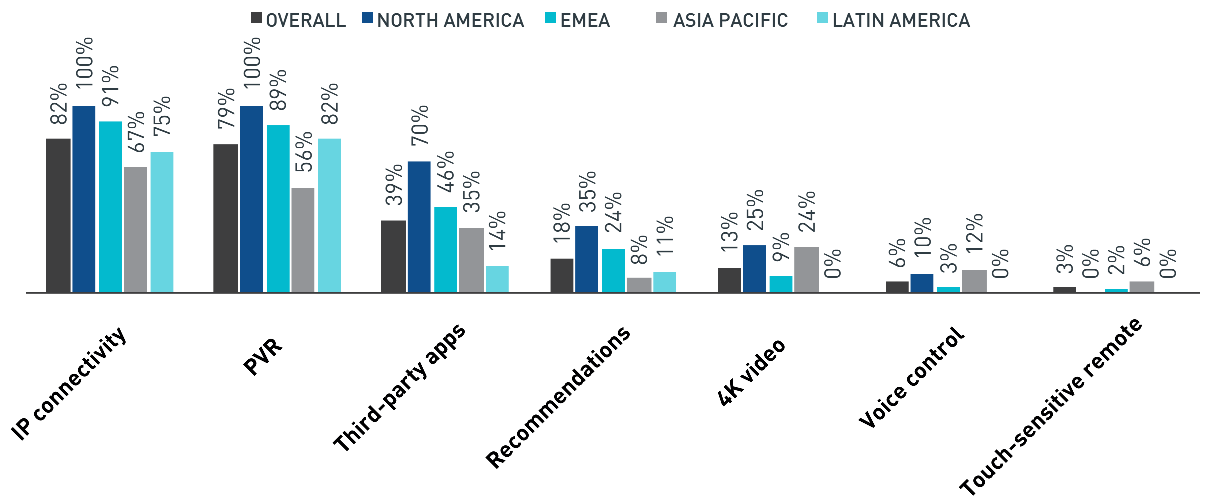


Core pay-TV offer

IP-connected set-top boxes and personal video recorders (PVR) are widespread, and have become almost universal in North America and EMEA, with nearly all pay-TV service providers offering these functionalities on their top-of-the-range set-top boxes. The availability of more advanced features – such as 4K, voice control, content recommendations and touch-sensitive remotes – is limited, but is more common among advanced service providers in North America and Asia Pacific (See Exhibit 13).

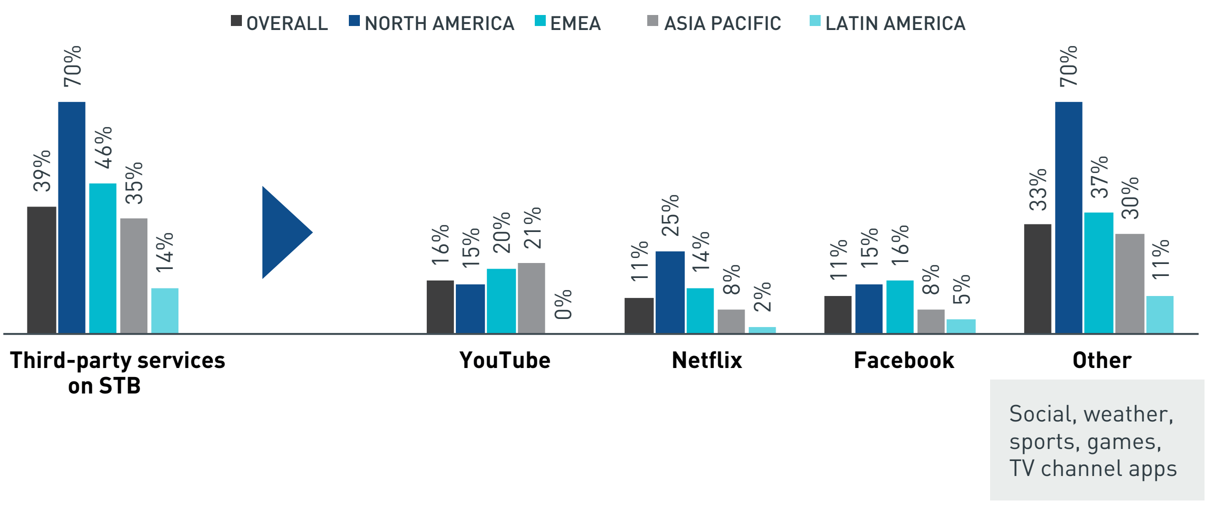
[15] Portfolio innovation scores by region; Average scores are weighted by the number of pay-TV subscribers; Base: Pay-TV service providers in Asia Pacific, EMEA, Latin America, and North America (n = 231)

Exhibit 13: Proportion of service providers offering features on their top of the range STB (%)[16]



Third-party applications on set-top boxes are relatively widespread, offered by 39% of pay-TV service providers globally, and are particularly common in North America and EMEA, offered by 70% and 46% of service providers respectively. Such features tend to be offered by telcos – in most cases, content and service aggregators aiming to provide their customers with access to the most popular online services (e.g. YouTube, Netflix). It seems that pay-TV service providers are embracing the shift towards OTT video consumption – YouTube is the most commonly offered service (16% of service providers), but Netflix is also relatively popular (11%), particularly in North America (25%) (See Exhibit 14).

Exhibit 14: Proportion of service providers offering third-party services on their top-of-the-range STB (%)[17]



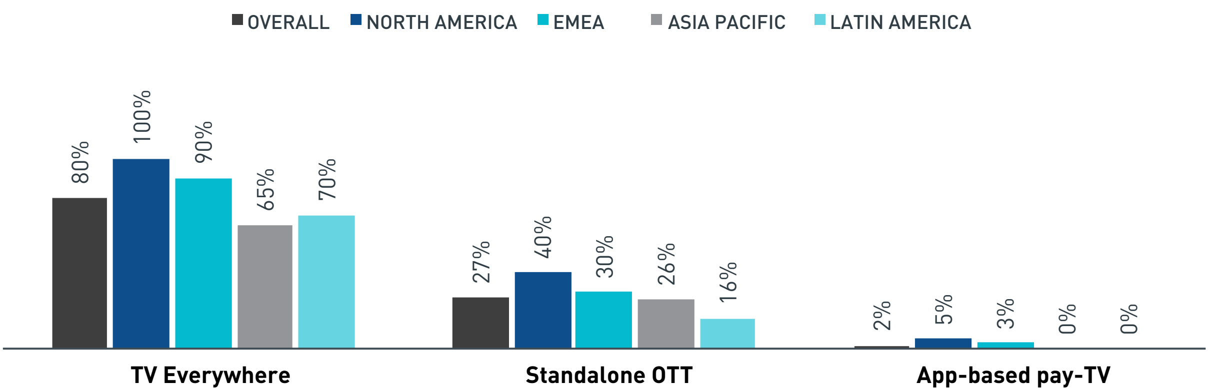
[16-17]Base: Pay-TV service providers in Asia Pacific, EMEA, Latin America, and North America (n = 231)

Meanwhile, multiscreen TV Everywhere services have become widespread, with 80% of service providers offering services that allow customers to access aggregated content from channels included in their pay-TV subscriptions on portable devices – service providers in Asia Pacific and Latin America are slightly behind those in North America and EMEA in this respect.

27% of pay-TV service providers have also launched a standalone OTT service such as Now TV from Sky, Sling TV from DISH Network or Foxtel Play from Foxtel. Such services are primarily aimed at fending off competition from standalone OTT content aggregators, but can also tap into new customer segments seeking skinny bundles and mobile-first solutions. Here, Latin American service providers lag behind their counterparts in other regions, with only 16% offering standalone OTT services (See Exhibit 15).

App-based pay-TV services are much less common than TV Everywhere and standalone OTT services, with only a few North American and European service providers, such as Time Warner Cable and Movistar, offering them to their customers. Many pay-TV executives have been sceptical about the app-based model for a variety of reasons. These include the requirements for significant streaming and delivery platform investment, the technical challenges involved and potential loss of revenue – many executives believe customers might be inclined to pay less for such solutions, because they do not have a clear hardware cost attached to them. However, innovation in this area might be accelerated by the growing number of competing app-based, direct-to-consumer services from content providers, which allow consumers to access premium video content without the need to subscribe to a pay-TV package.

Exhibit 15: Proportion of service providers offering OTT services (%)[18]



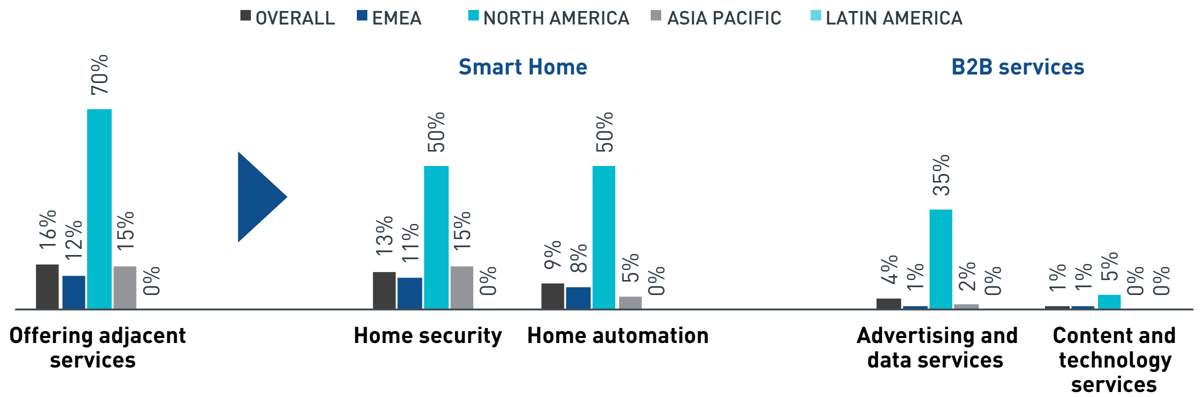
Adjacencies

Adjacency diversification is less common, with only 16% of pay-TV service providers offering adjacent products or services. Smart Home solutions relating to home security (13% of service providers) and, to a lesser extent, home automation (9% of service providers) are the most common type of services, mainly offered by major telcos and large cable operators (e.g. Home by SFR, Smart Home by StarHub, Xfinity Home by Comcast, and Intelligent Home by Time Warner Cable). B2B services are still in their early days, with only 4% offering advanced advertising and data services and 1% providing content and technology services.

[18] Base: Pay-TV service providers in Asia Pacific, EMEA, Latin America, and North America (n = 231)

Major North American pay-TV service providers stand out in terms of adjacency diversification, with 70% of service providers offering products and services in this category. North American providers are also the global leaders in terms of B2B services, with 35% of service providers offering advanced advertising and data services, such as addressable advertising solutions from AT&T / DIRECTV, Dish Networks, Time Warner Cable, and Cablevision (See Exhibit 16).

Exhibit 16: Proportion of service providers offering adjacent services (%)[19]



4 — INNOVATION MODELS – HOW DO PAY-TV COMPANIES INNOVATE?

Perhaps unsurprisingly, approaches to innovation vary widely across the pay-TV industry – reflecting the scale, resources and capabilities of different pay-TV providers, their ability to recruit, nurture and retain talented people, and the maturity and competitiveness of the markets they operate in, amongst other things. At a high level, industry executives distinguishing between five main innovation models, described below (See Exhibit 17).

Exhibit 17: Innovation models for the pay-TV industry

In-house
- Use internal R&D and NPD teams to create products and services from scratch

Supplier led
- Work with suppliers to drive innovation, often on top of in-house development of software / UI

Corporate venturing / M&A
- Buy stakes in companies offering new innovation- standalone or to integrate into pay-TV offer

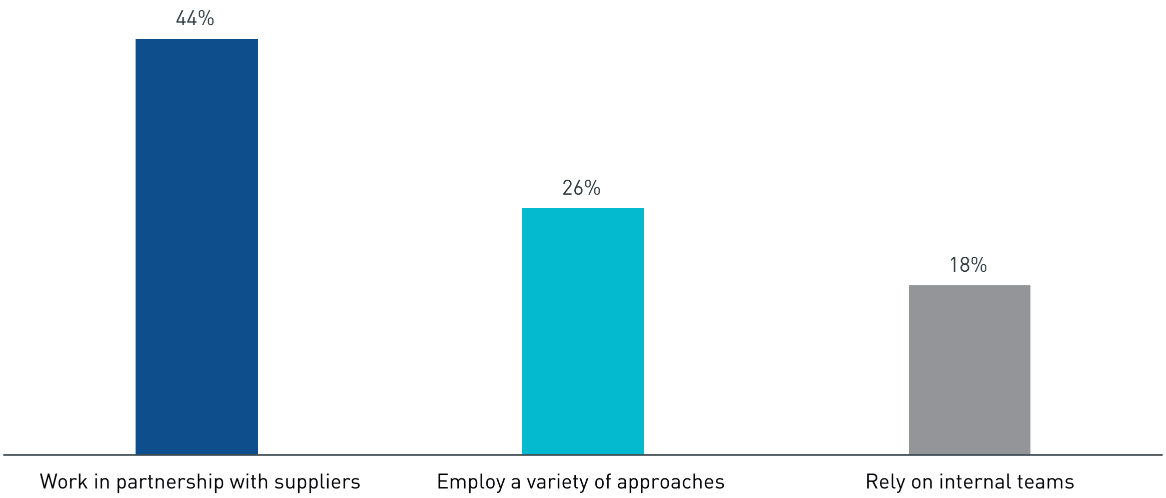
Consortium or partnership
- Work with others to share investment and build standards

Open innovation
- Allow third-parties access to your platform or APIs enabling them to create apps/services

[19]Base: Pay-TV service providers in Asia Pacific, EMEA, Latin America, and North America (n = 231)

Historically, the largest pay-TV providers have tended to rely on a mix of in-house and supplier-led innovation to upgrade their platforms and to deliver significant enhancements to their product and service offerings – with internal teams working closely in partnership with trusted suppliers for R&D and new product development. Smaller operators have tended to depend more on suppliers, lacking the footprint scale to generate strong returns from internally-driven innovation. Other approaches were far less common, inhibited by high barriers to entry for suppliers and complex, proprietary technology platforms.

Exhibit 18: Innovation models for the pay-TV industry[20]



Today, the industry makes use of a more diverse portfolio of approaches, especially in more advanced markets. In North America and Western Europe, executives are looking to follow balanced innovation models, trying to blend in-house with supplier-led innovation. This change has been enabled in part by the adoption of more flexible underlying technology platforms, which have made it possible for smaller teams to develop and roll out new on-platform products: *"We used to reply completely on a key supplier, but we now run an internal team that leads the development of most of our new products and heads up innovation. It's easier because the latest TV platforms are less proprietary and more innovation-friendly, so there's a deeper pool of talent who can work on innovation. As we're getting ready to roll out new products across our footprint, we're trying to ensure that we have the key capabilities in-house. At the end of the day, we need to be able to differentiate."*

75% OF EXECUTIVES AGREE THAT PAY-TV SERVICE PROVIDERS *"WILL EMPLOY A BALANCED APPROACH TO INNOVATION, RELYING ON A MIX OF IN-HOUSE AND THIRD-PARTY SOLUTIONS, OVER THE NEXT 5 YEARS"*[21]

Pay-TV executives believe that with the right incentives in place, the balanced approach enables their companies to stimulate creativity, accelerate product development and launch innovative products and services: *"Strategic partnerships with suppliers provide scale in innovation, as they tend to work across multiple territories and consumer segments.*

[20]Question: Which of the following best describes your organisation's approach to innovation / new product development? (pay-TV service providers only, n = 61)

[21]Question: To what extent do you agree or disagree with the following statements about innovation and the pay-TV industry? (n = 92)

Historically, our priority while working with suppliers was to cut costs. The partnership model is definitely a better one – it engenders creativity and we can all benefit from it."

Although executives believe that a balanced approach – in-house teams working closely with partners and suppliers – can help to create better customer experiences, it can also create new challenges: *"It's really difficult finding the right partners, especially in areas that we have less experience in. It was a steep learning curve for us trying to learn how to make these new partnerships work."*

Moreover, executives in Latin American and the Asia Pacific region cite access to talented technologists and developers as an important barrier: *"The supply of top talent is very limited and there's intense competition – so we often have to lean more heavily on suppliers."*

Alongside the more widespread adoption of mixed approaches, some larger operators have also ramped up their corporate venturing activities, to ensure better control of critical resources and capabilities and to take advantage of the proliferation of start-ups and new technology companies entering the market: *"There are far more companies out there, investing in new technologies and products that are relevant to different parts of our business – advertising, marketing, OTT services, new kinds of content. Internal teams can't compete with that level of investment, so we treat it as outsourced R&D."*

Historically, open innovation and consortium approaches to innovation have been rare in the pay-TV industry, in part because many companies have been keen to retain tight control over their innovation efforts and proprietary platforms have limited the scope for collaboration and partnership: *"There's a good reason why we don't see many consortiums across the industry. It's too hard to make them work, particularly because you need to bring various players to the table – such as content providers and distributors – who have very different motivations and roles in the market."* Open innovation models are perceived to be similarly challenging: *"We need to maintain tight control over our platform – it's too hard to let third-party developers in. We're a gatekeeper business. It's also hard to make the incentives work – developers will work on apps for the iPhone because they can reach hundreds of millions of customers, but most pay-TV businesses are much smaller than that."*

However, there are signs of change. In the USA, the Reference Design Kit[22] (RDK) consortium has gained traction, delivering benefits in terms of standardised set-top box technology, time to market and pricing.

Similarly, some technology suppliers are looking to encourage investment in applications sitting on storefronts, app stores and common technology platforms, providing pay-TV providers with the option to select a semi-open platform with a pre-existing range of applications from third-party providers. Views about the prospects for these initiatives are mixed: *"It's not quite open innovation, but you can see the benefits, especially for smaller operators. It's early days, but I'm just not sure that most operators will want to give up control and provide access to their customers."*

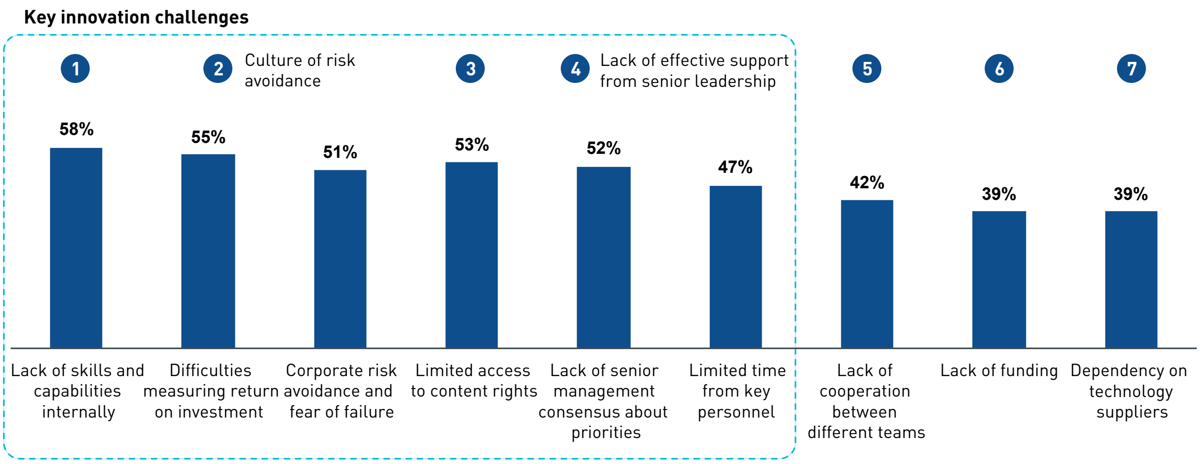
[22]RDK is a pre-integrated software solution that powers customer premise equipment for pay-TV service providers. It is managed by a joint venture between Comcast, Time Warner Cable and Liberty Global.

What barriers prevent industry participants from pursing innovation opportunities? As innovation has grown in importance across different industries, surveys and indices have proliferated, seeking to identify the most innovative companies and to analyse their distinctive attributes and approaches. Most of the published studies[23] identify international technology and manufacturing companies as the most innovative companies, firms such as Apple, Google, Tesla Motors, Microsoft, Samsung, Toyota, BMW, Amazon, 3M and General Electric, Intel and Cisco. Pay-TV providers rarely feature in these indices, although some studies do make reference to Disney, Netflix and BT Group.

To some extent, this is unsurprising. Although approaches vary, most published studies are based on surveys with international industry executives and, as such, tend to favour firms with large international footprints and well-known brands, whereas most pay-TV providers are generally restricted to only a handful of territories, limiting their visibility.

However, many pay-TV providers do face significant innovation challenges. Executives highlight a number of major challenges that they believe are common across the industry (See Exhibit 19).

Exhibit 19: Executives highlight the following key innovation challenges across the pay-TV industry[24]



So, why are these seen as major innovation challenges across the pay-TV industry?

1. Lack of skills and capabilities internally

Pay-TV service providers struggle to develop relevant innovation skills and capabilities internally, particularly those requiring expertise beyond the core pay-TV offer. Key challenges relate to attracting and retaining technology (e.g. software developers, engineers) and commercial talent, and the fact that most are unable to afford large-scale in-house R&D and new product development teams. Shortage of technology talent is seen as a particularly important issue in the Latin American pay-TV industry, where many executives argue that finding people with the right set of skills and capabilities is difficult – which partly explains why so many pay-TV service providers in the region tend to rely on third-party technology suppliers: *"Finding great engineers locally in Latin America is very difficult. Pay-TV service providers need to make themselves attractive employers to young people, but it's not that easy when we're competing with international technology companies."*

2. Culture of risk avoidance

51% of industry respondents claim that pay-TV service providers are too risk averse and, in many cases, do not have the right incentives in place to stimulate innovation. This is particularly true of telcos: *"A lot of telcos started playing the pay-TV game recently and were quite successful at the start. However, traditional telco guys like predictability and want to quantify things. Unfortunately anything related to media and content doesn't work like this: you can't quantify with certainty the net present value of one movie or series vs. the others. There is much more gut in pay-TV than in broadband networks and innovation requires that as well."*

Similarly, many executives suggest that a strong focus on ROI can deter innovation, especially when thresholds are very high: *"It's very hard to measure the return on OTT services, when you have the rest of your pay-TV business running profitably. However, pay-TV operators need to consider the opportunity cost of being late to the OTT game."*

The picture appears to differ slightly in North America, with industry participants arguing that major pay-TV service providers there have been very successful in experimenting and developing proof-of-concept products and services, but have nevertheless often struggled to roll out these innovations to their customers, because of the high ROI threshold and the perception that they need to protect their core business: *"MVPDs tend to sit on a number of potential innovations that they could be launching, but they closely observe the market to make sure they do it at the right time, when the right level of market data is available, when there's more clarity about potential demand and when they can be sure that the new product won't cannibalise their existing business in a negative net present value way."*

3. Limited access to content rights

Dependency on content suppliers is seen as a major innovation challenge across all regions. Industry participants believe that content providers are inflexible and slow to respond to changing market conditions, limiting the types of innovation opportunities open to pay-TV service providers, who often find it difficult to get access to content rights at a reasonable price:

+ *"Pay-TV operators [in Europe] can roll out technology solutions quickly, but the key challenge is with rights-holders, who seek to protect their revenues. They have to cater to their big clients, which means that the industry is quite conservative, driven by consensus and is slow to respond to new requirements."*

+ *"Content rights are a big limiting factor [in North America]. Studios are hesitant to release non-linear content rights. They're trying to figure it out as there's no clear standard on how people consume content in the non-linear environment. Linear content is still the most 'comfortable' type of content for studios."*

+ *"Getting content rights is one of the top challenges that [Latin American] pay-TV operators face today. Pay-TV operators are trying to experiment with content providers, but content providers are slow in responding to their needs and do not really know how to price different types of content. Pay-TV operators cannot get access to the right types of content and, as a result, cannot build new services."*

4. Lack of effective support from senior leadership

Lack of senior management consensus about priorities and limited time devoted by key personnel are seen as important challenges to innovation in pay-TV businesses. Industry executives across the globe emphasise that in order for pay-TV companies to innovate successfully, innovation needs to be supported at the very top of the organisation:

+ *"There are many opportunities for innovation across the [North American pay-TV] industry, but nothing will happen without the senior management buy-in. Going forward, the industry needs more executives that are able to bring different experiences and perspectives together – almost a hybrid 'DIRECTV meets Netflix meets YouTube' type of a leader that is able to drive the innovation agenda forward."*

+ *"Senior leadership has to be supportive of innovation. If it's not in the DNA of the company, then other things will not help. Having worked for many pay-TV service providers in the [Asia Pacific] region, I've seen a lot of variation in terms of appetite for innovation – in some companies innovation is at the top of the board's agenda, in others it's tricky to get support for even the smallest incremental improvements in the offer, such as HD."*

5. Lack of co-operation between different teams

Industry participants argue that pay-TV companies in general and major telcos in particular tend to operate as a set of different silos that rarely work together. This is seen as an important challenge by some industry executives:

+ *"Pay-TV companies need a clear vision and close co-operation in order to overcome the various challenges and be ready to respond to constant change. Innovation is about bringing people from different teams together. With silos, no one is fighting for the whole company, everyone is fighting for their own tiny silo."*

+ *"In order to drive innovation, pay-TV companies need visionary and open-minded leaders, who can bring together different teams that usually work separately and who are able to build commitment to innovation projects across the organisation."*

6. Lack of funding

Despite a strong consensus that innovation is one of the top strategic priorities for the pay-TV industry, many industry participants think that funding R&D and new product development projects is difficult, for a variety of reasons, including competing priorities and difficulties in building business cases:

+ *"Everyone says 'innovation is absolutely key', but the industry's investment profile tells a different story – 50% of the budget goes to 'keeping the lights on', 30-40% on incremental improvements and then only a small proportion of the remaining 10-20%, at best, goes into innovation."*

+ *"For us, as pay-TV operators, content investment is often so huge compared to anything else that most of the time is spent thinking about the content solution. This creates a big battle in terms of investment priorities and time."*

+ *"I feel that it's been very difficult to monetise innovation in the emerging markets. A lot of market players are in the price-war regime, offering substantial discounts, giving extended free trials or bundling pay-TV service with broadband at low or no extra cost. They are not teaching customers the value of pay-TV services."*

7. Dependency on technology providers

Some industry participants argue that high dependency on technology providers, particularly among the small-scale service providers, creates a variety of innovation challenges, including potential technological lock-in, limited control over costs, and little scope for differentiation. Service providers need to be very rigorous when selecting a technology partner: *"Most pay-TV businesses depend heavily on solutions and innovations developed by their suppliers. Usually, they have long-term, high-value relationships with their technology suppliers. As a result, a lot of pay-TV operators' success is directly linked to how reliable, innovative, and visionary their technology supplier is."*

55% OF EXECUTIVES BELIEVE THAT SUPPLIERS AND VENDORS WILL BE THE MAIN SOURCE OF INNOVATIVE PRODUCTS AND SERVICES DURING THE NEXT 5 YEARS[25]

In addition to the above-mentioned challenges, a number of executives believe that pay-TV service providers are held back by legacy infrastructure and do not have the right processes and culture in place to support innovation. Speed and agility are often cited as critical capabilities for innovative companies, helping them to respond quickly to changing market conditions and consumer preferences and to reduce the costs of developing new offerings. In many cases, these go hand-in-hand with lean development methodologies, which entail early testing and constant iteration and improvement, presenting different versions of a digital service to users to test responses or conversion rates and using automated processes to optimize offerings.

Although such 'agile' approaches are well-known and widely-used by many pay-TV providers, industry executives believe that innovation at speed and constant iteration and improvement remain a challenge for many operators, primarily because of the complexity and inflexibility of legacy TV platforms and concerns about disrupting services. New products can take many years to develop and deploy, even for the most advanced operators – Sky, for example, claims to have *"been on the development journey of Sky AdSmart for about the last five years or so."*[26]

Pay-TV providers and their suppliers are developing technical solutions to these challenges, migrating to more flexible platforms that support the rapid launch and operation of new services and reduce implementation risks. However, these migrations can take a long time, especially for operators with large subscriber bases.

[25]Question: To what extent do you agree or disagree with the following statements about innovation and the pay-TV industry? (% of respondents indicating "strongly agree" or "agree"; n = 92)
[26]IPTV News, Sky, AdSmart: "This is a significant strategic play for Sky" (2014)

Pay-TV executives believe that there is considerable scope for innovation in pay-TV products and services to help drive the next stage of industry growth. So, which are the most commercially attractive areas of opportunity for the pay-TV industry over the next five years? Although investment priorities vary significantly by market and service provider type, the majority of providers agree that the most commercially attractive opportunities relate to strengthening and differentiating their core pay-TV and OTT propositions – both in terms of product and business model (See Exhibit 20). On the product side, service providers will focus on delivering connected, interactive, and seamless pay-TV experiences across multiple devices by deploying next-generation technology platforms, set-top boxes, content discovery engines, and multiscreen TV Everywhere services. While on the business side, innovation will focus on content pricing and packaging, taking a more segmented view of customers and introducing more flexibility.

Exhibit 20: Executives see strengthening the core pay-TV offer as the most attractive area of opportunity[27]

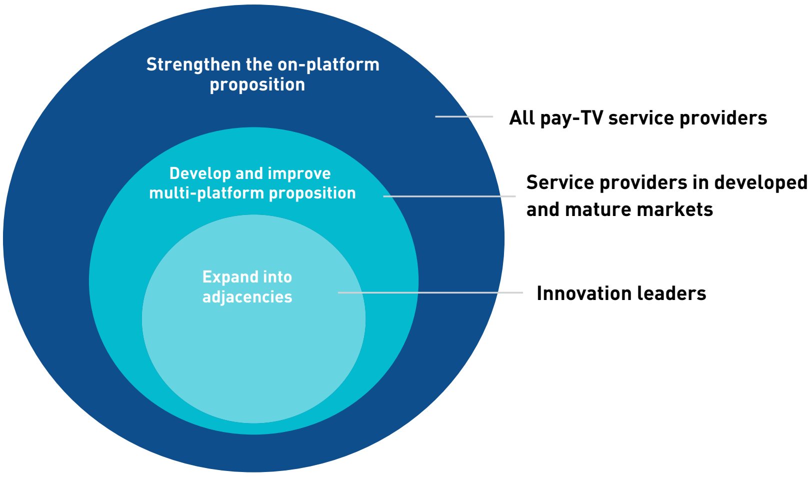
Core pay-TV offer	Paid OTT TV	Adjacencies
New ways to price and package content: 72%	Standalone OTT: 53%	Advertising and data: 54%
Advanced functionality: 45%	Multiscreen TV Everywhere: 76%	Internet of Things / Smart Home: 39%
New types of content offering: 73%	App-based pay-TV: 41%	Technology white labelling and licensing: 30%

Key: Commercial attractiveness Low — High

Service providers in more developed and mature markets expect to focus on improving their existing products and services to differentiate their offerings, developing complementary products for their existing customers, and expanding into adjacencies. On the other hand, service providers in emerging markets with lower broadband and pay-TV penetration envisage focusing on developing products and services to drive take-up and attract new first-time customers (See Exhibit 21).

[27] Question: What do you see as the most commercially attractive areas of opportunity for pay-TV service providers? (% of respondents indicating 4 = attractive and 5 = highly attractive, n = 92)

Exhibit 21: Innovation priorities by service provider characteristics



In general, industry participants are more cautious about the opportunities for most providers to expand significantly into adjacencies. Innovation in this category is expected to be driven by the true innovation leaders – namely, major telcos and large-scale pay-TV service providers (See Exhibit 21): *"Only innovation leaders will be able to address these areas successfully – major telcos and the largest pay-TV businesses. Smaller businesses will have to be smart, agile and truly innovative to gain traction in these areas."*

86% OF EXECUTIVES AGREE THAT *"TO GROW, PAY-TV SERVICE PROVIDERS WILL HAVE TO DEVELOP NEW PRODUCTS AND SERVICES TO SIT ALONGSIDE THE CORE PAY-TV AND OVER-THE-TOP PROPOSITIONS."* [28]

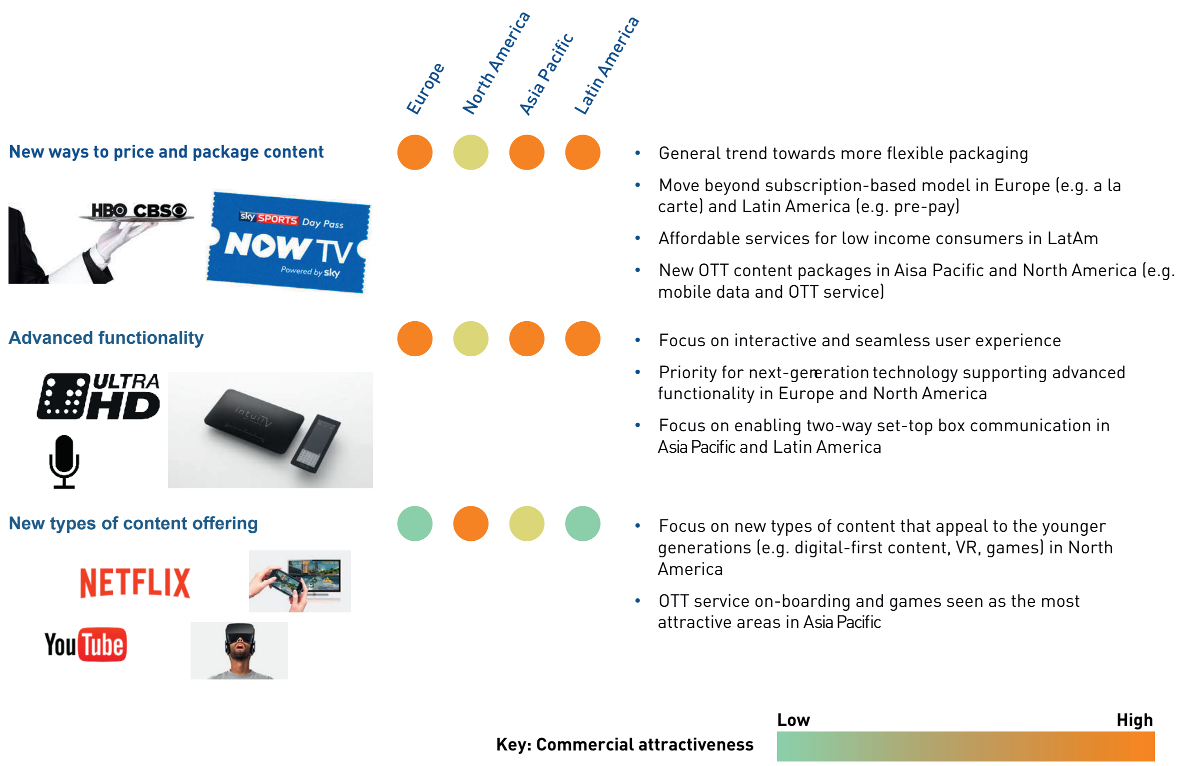
Industry executives' views on the relative commercial attractiveness of opportunity areas differ by region. In forming these views, executives took into account a range of factors, including the scale of potential opportunities, the business case and operational challenges. As such, the cross-regional comparisons described in the following section compare the relative perceived attractiveness of these opportunities, not the relative absolute scale of opportunities.

THE CORE PAY-TV OFFER

Pay-TV executives expect the core pay-TV offer to be the most commercially attractive area of opportunity over the next five years, with significant opportunities in pricing and packaging of content, and delivering better user experience and more value to customers through advanced functionality and features. In addition, industry participants see significant scope for innovation in online services, particularly standalone OTT and multiscreen TV Everywhere. However, monetising these online services is perceived by industry participants to be a significant challenge, which will require service providers to take a long-term perspective and educate consumers about the value of such services (See Exhibit 22).

[28]Question: To what extent do you agree or disagree with the following statements about innovation and the pay-TV industry? (% of respondents indicating "strongly agree" or "agree"; n = 92)

Exhibit 22: Opportunities in the core pay-TV offer - pricing, functionality, and content



NEW WAYS TO PRICE AND PACKAGE CONTENT

Industry participants believe that there is a substantial opportunity to flex pricing and packaging of content to develop new offers, such as skinny bundles and à la carte options. The general trend away from big bundles is expected to continue across all regions: *"Content unbundling will be huge and customisation will be more granular going forward. Consumers will be able to pick channels, networks and other types of content they want to subscribe to more freely."*

The European pay-TV industry, which has already seen a wave of skinny bundles being launched by various providers, is expected to move slowly beyond the subscription-based model and introduce more flexible pricing options, such as à la carte and daily or weekly passes. In addition to flexing pricing and packaging to cater to younger and more price-conscious consumers, Latin American service providers are also expected to develop services targeted at low-income consumers who cannot afford existing services. In North America and Asia Pacific, innovative pricing and packaging of content is expected to extend beyond the TV platform, with many triple- and quad-play providers introducing novel OTT packages, such as mobile data and OTT service bundles that allow video streaming without depleting the data allowance, or freemium models for standalone OTT services.

Advanced functionality

Pay-TV executives expect significant innovation in terms of advanced functionality, with a key focus on delivering a more interactive and seamless user experience. Improving customer retention and product differentiation are seen as the main incentives here. Meanwhile, making content discovery as easy and intuitive as possible is seen as the key commercial opportunity across all regions: *"OTT video* *services have transformed consumer expectations, but connectivity and technology advances have also changed what we as pay-TV operators can deliver to our customers. For us, a lot of focus over the coming years will be on transforming the user experience by bringing the linear and on-demand content together, making it easy to transition between different types of content, and ensuring it is easy to search and navigate all the content that is available to our customers."*

European and North American service providers are expected to focus their investments on next-generation IP-based technology that supports easy-to-use user interfaces, content discovery, voice control and 4K video quality: *"As content delivery becomes more IP-based, it will allow the pay-TV experience to become more enriched and interactive, enabling consumers to uncover interesting information about the content they're viewing, interacting with that content through social networks and supporting related content discovery."*
In Latin American and Asia Pacific countries, where IP-connected set-top boxes are not deployed as widely as in other regions, service providers are expected to focus on connecting their customer base to enable two-way communication and deliver interactive services: *"The number one priority is the digitisation of the pay-TV experience in terms of delivering a better end-to-end experience to our customers and reducing the cost of operation and customer acquisition. We need to bring our services into the 21st century. As consumers are comparing pay-TV services to Netflix, pay-TV service providers need to deliver an interactive digital user experience across all consumer devices."*

In emerging countries in Asia, such as Philippines and Indonesia, where IP connectivity is still a major issue, pay-TV service providers are recognising the need to differentiate their services by introducing value-added services, such as HD video quality and PVR, and new functionality: *"If you look at the satellite operator strategies (in South East Asia) over the last two years, all of them have focused on squeezing the maximum out of their existing proposition and offering the best prices. Now we're seeing rationalisation and investment in new set-top boxes with differentiating functionalities and more focus on quality customers."*

New types of content offering

New types of content offering are seen as a significant commercial opportunity among the North American and – to a lesser extent – Asia Pacific pay-TV service providers.

Many North American providers are investing in content that appeals to Millennials and Generation Z[29]. The key areas of innovation include digital-first content (e.g. linear channels of short-form YouTube-style content), on-boarding of third-party OTT services, virtual reality (e.g. first-person sports experiences through a VR headset), and gaming (e.g. accessing games through the set-top box). Since a significant number of creators of these types of content are US-based, much innovation in this area is expected to happen there first: *"All pay-TV operators are zeroing in on the youth demo. Millennials – that's where the real urgency is, it's about broadening the customer base and addressing the needs of consumers that are not tuning in."*

Some Asia Pacific pay-TV service providers see value in providing OTT or games content on their pay-TV platforms, particularly through partnerships with OTT content providers and game publishers: *"Partnerships with content providers like YouTube or Netflix or game developers are where a lot of convergence in consumer behaviour is happening. Our strategy is to bring all entertainment together on our platform, while the key task and challenge for us is to ensure that the whole experience fits nicely together."*

[29]Generation Z refers to the generation that was born between 1994 and 2010.

European and Latin American service providers do not consider new types of content offering to be a major area of opportunity over the next five years, because other product areas, such as pricing and packaging and advanced functionality, are considered to be more commercially attractive. In addition, many European providers have already on-boarded various third-party content services and further opportunities are expected to be limited, while the majority of Latin American providers have yet to develop set-top boxes that support third-party OTT content.

Standalone OTT

Developing standalone OTT services is seen as a major commercial opportunity among Asia Pacific and North American pay-TV service providers, owing to the potential of these services to expand geographical footprints and address new customer segments. However, European and Latin American providers rated standalone OTT services lower in terms of their commercial attractiveness relative to other product and service areas, because the business cases of standalone OTT services are perceived to be challenging.

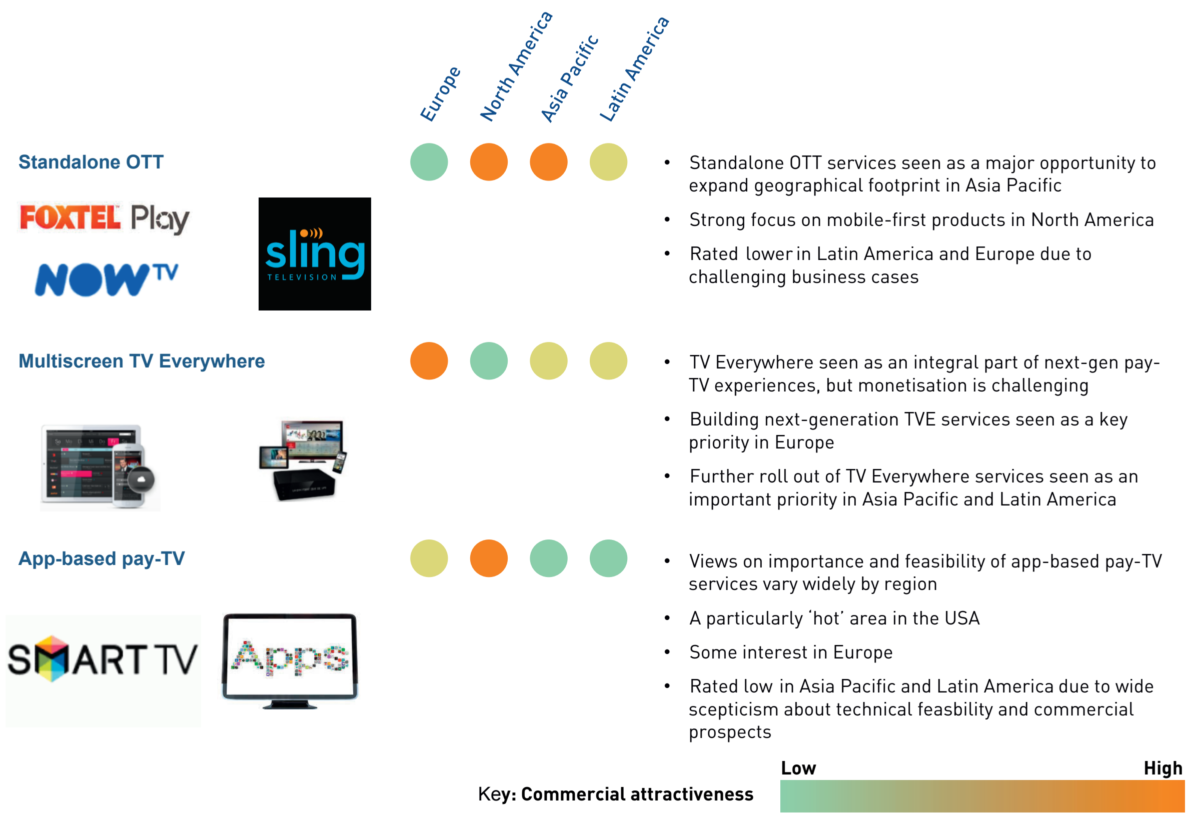
Most industry participants in Asia Pacific argue that standalone OTT services are not only a defensive play against emerging OTT players, but also a great commercial opportunity to differentiate their offerings from other 'traditional' pay-TV packages and attract new customers outside their existing geographical footprints: *"Standalone OTT is becoming very important in our market. Operators are feeling the pressure – why would we create a product that would cannibalise our existing offer? But we are slowly realising that this could unshackle us from the geographical limits and would help us build scale."* Meanwhile, for mobile telcos, standalone OTT services are seen as key to monetising their mobile data services.

North American providers see a major opportunity in developing mobile-first standalone OTT products, such as Verizon's go90 or T-Mobile's Binge On, which offer access to content that appeals to younger and more mobile audiences. This trend is particularly evident in the US, where the scale of the smartphone market and rapid growth in mobile video viewing support strong business cases for these types of product: *"Having overlooked mobile viewing for a while, pay-TV service providers are finally starting to focus on it properly. It's about creating mobile-first products for Millennials that have the right types of content and a strong social aspect."* In line with industry participant views in Asia Pacific, OTT services are seen as a great way to sell mobile data services: *"Mobile-first pay-TV products will have a great appeal for consumers, particularly when bundled with mobile data, where the data used on the video product won't be deducted from the allowance."*

European service providers believe standalone OTT services have significant potential, although opportunities for new service launches are perceived to be limited, given that many services have already been launched. In addition, European executives believe that the business case for these services is challenging. Compared to executives in other regions, they therefore rated standalone OTT services as less commercially attractive than other opportunities.

Similarly, Latin American executives rated standalone OTT services lower in terms of their commercial attractiveness compared to executives in Asia Pacific and North America, because other areas, such as advanced functionality, are considered to offer more commercial opportunities in Latin America (See Exhibit 20). However, several Latin American service providers are actively exploring opportunities to launch new offerings, albeit primarily as a defensive response to competition, rather than as a major revenue opportunity – at least in the near term: *"OTT still is considered to be a major area of opportunity [in Latin America]. Everyone is investing in it. However, in most cases it's a 'me too' approach, where the economics are still highly questionable."*

Exhibit 23: Opportunities in core pay-TV offer - online services



Multiscreen TV Everywhere

Multiscreen TV Everywhere is considered to be an integral element of next-generation TV experiences, with industry participants in most regions expecting to see significant innovation in this area. However, in most markets, monetisation of TV Everywhere services is considered to be challenging.

Although TV Everywhere services are almost ubiquitous in Europe, TV executives in the region have rated them as a major commercial opportunity, seeing a significant opportunity to improve existing offerings by providing a seamless, next-generation user experience across multiple devices:

+ *"TV Everywhere is still at the 1.0 stage and a lot needs to be done to bring it to 2.0. We need to make sure we offer an integrated and seamless experience across all screens and devices and TV Everywhere is at the centre of that."*

+ *"There are still lots of opportunities to extend content onto new screens – to deliver the next generation of aggregation services and to make the mobile viewing experience easier and more user-friendly."*

Despite their limited revenue potential, Latin American and Asia Pacific executives consider TV Everywhere services to be an important opportunity over the next five years. Service providers in both regions are expected to roll out new multiscreen solutions in order to evolve their propositions and improve their competitive positions: *"Multiscreen TV Everywhere services are a key priority: they help keep pay-TV services sticky. Eventually, these services will put pay-TV operators on a competitive footing relative to OTT services."*

North American executives rated multiscreen TV Everywhere services lower in terms of their commercial attractiveness than executives in other regions, arguing that these services are already ubiquitous and have limited potential to drive revenue growth. Nonetheless, North American executives agree that TV Everywhere is crucial to next-generation pay-TV services and that service providers will innovate in this field. However, other areas, such as Smart Home solutions and app-based pay-TV services, are seen as greater commercial opportunities over the next five years.

App-based pay-TV services

Views about the importance and feasibility of developing app-based pay-TV services vary strongly by region. The majority of service providers in Asia Pacific and Latin America are sceptical about the technical feasibility and commercial attractiveness of developing such services and do not expect to see many new service launches in their regions. However, a few large-scale, well-funded pan-regional Latin American telcos have started testing the feasibility of these services, because of their potential to *"transform the economics of pay-TV services in terms of technology and equipment costs."*

In contrast, industry participants in Europe and North America are quite optimistic about the prospects of app-based pay-TV services, arguing that improved flexibility and potentially lower customer costs will drive take-up: *"The reality is that the new generation of consumers is going to pay a lot for high-speed broadband and won't appreciate a hefty set-top box expense on top. We will move into the 'bring your own box' reality, where users will want to access content on their preferred devices, whether it is Smart TVs or dongles."*

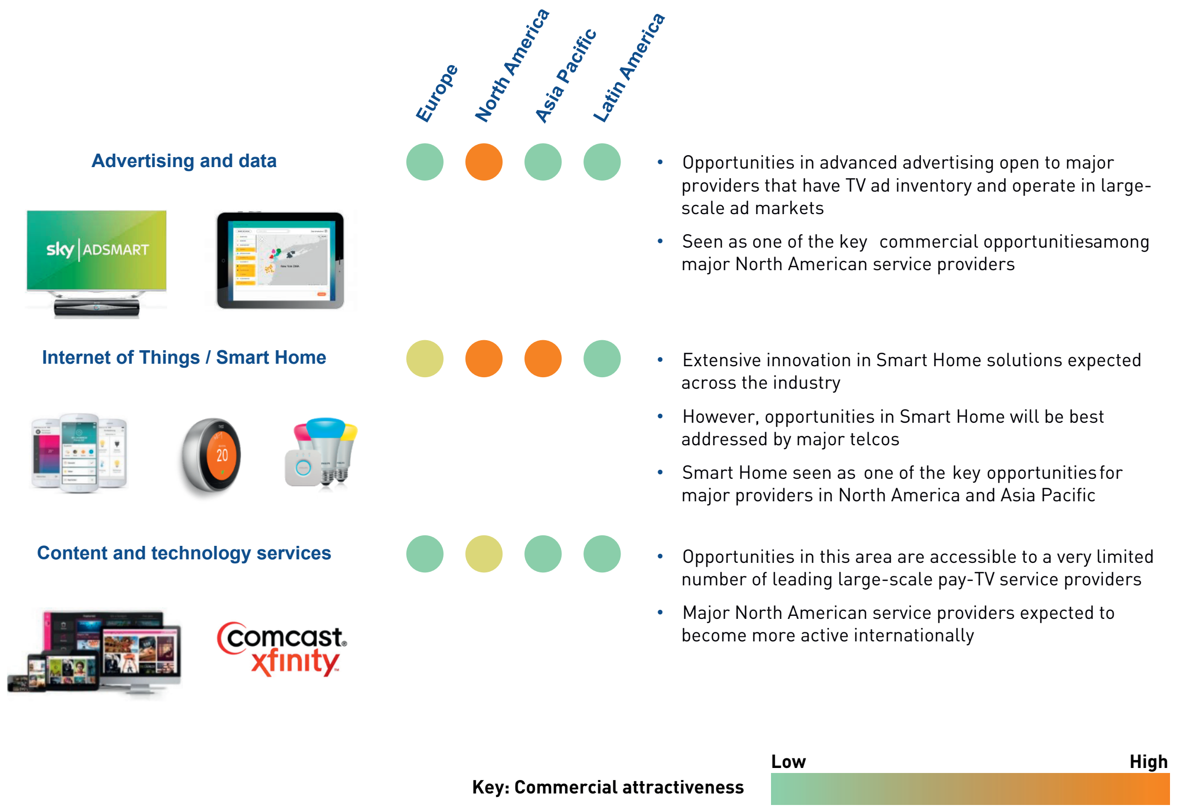
App-based pay-TV services are seen as an especially 'hot' area in the US, following a recent proposal from the FCC, the industry regulator, to 'unlock the box', which would allow consumers to access MVPD video content without the obligation to rent a set-top box. However, industry participants are divided over whether Smart TVs or a 'bring your own box' model for app-based services will dominate, and some have raised concerns about service quality and security when delivering pay-TV services via a third-party platform: *"To deliver a good TV experience we need to have a certain level of control over the network and software that is used to deliver and present video content. The set-top box model ensures a uniform platform across every household."*

ADJACENCIES

At present, industry executives believe that few operators are well positioned to successfully address major adjacencies, with only large-scale enterprises and major telcos likely to successfully address these opportunities.

Regionally, operators in North America appear best positioned, due to their scale and the characteristics of the market (See Exhibit 24).

Exhibit 24: Opportunities in adjacencies



Advertising and data

Pay-TV executives recognise the importance of customer and audience data as well as advanced advertising solutions, but few have the scale and resources to harness and monetise them. Opportunities in advanced advertising are open mainly to major pay-TV operators that operate in large-scale advertising markets, have large IP-connected customer bases and have access to advertising inventory (either through their own TV channels or through sales houses that sell on behalf of other TV channel owners).

Since most of these conditions apply to the biggest North American pay-TV service providers, they see advanced advertising as one of the key commercial opportunities. They are accordingly expected to leverage their assets and capabilities to offer innovative targeted advertising and dynamic ad insertion solutions which deliver more relevant and higher-value advertising across multiple customer devices. Most executives in other regions rate advanced advertising solutions as a limited area of opportunity, since other product areas, such as pricing and packaging and advanced functionality, are considered to be more feasible and commercially attractive.

Internet of Things / Smart Home

Industry participants expect to see extensive innovation in Smart Home solutions, particularly in home automation and home security solutions. However, there is a consensus in the industry that these opportunities will be best addressed by large telcos that own network infrastructure, have significant scale in the consumer market and have already developed capabilities in offering IoT solutions (e.g. connectivity solutions for 'smart' cities and machine-to-machine applications).

Executives in North America and advanced Asia Pacific markets rate Smart Home solutions as a key commercial opportunity for the next five years, particularly among leading service providers that have already developed strong core pay-TV propositions and are looking to roll out new products to their large and wealthy customer bases. On the other hand, executives in Latin America and Europe rate Smart Home solutions lower in terms of their commercial attractiveness than executives in other regions, because of challenging business cases and more substantial opportunities in other product areas. That said, they still expect some service providers to innovate in this area: *"At present it's hard to monetise and capture value from Smart Home, but it's definitely at the peak of expectation. We'll see a lot of innovation in this area, both in terms of technology and business model."*

North American service providers are already leading the way globally in Smart Home solutions, which are expected to be one of the key commercial opportunities over the next five years, helping major pay-TV operators maintain their gatekeeper role and providing new opportunities to collect and utilise vast amounts of data on consumer behaviour: *"The Smart Home vertical will allow the pay-TV industry to remain relevant. If they simply stick with the traditional pay-TV model, they will be blown out of the water. If you don't own anything in a consumer's home then you're just a broker. By innovating in the Smart Home space, pay-TV service providers can also maximise the value of their broadband networks and ensure the stickiness of their service."* However, pay-TV executives expect to face substantial competition in the Smart Home space, primarily from technology giants: *"We're already moving into Smart Home, but it's a nascent market. I can see Amazon and Apple making a play in this market, but I'm not sure that we – the pay-TV service providers – can compete at the same level."*

Similarly, executives in Asia Pacific consider Smart Home solutions to be one of the key commercial opportunities in the region, particularly among telcos in larger and more developed markets, such as Japan, South Korea, and Australia: *"For us as a telco, it's a natural evolution of our strategy and a big area of focus going forward. We want to own the consumer's home. When we're rolling out infrastructure to new developments, we try to make sure that it can support our Smart Home solutions."*

Content and technology services

Content and technology services are considered to be accessible to a very limited number of leading pay-TV service providers, such as Comcast and Sky, which have strong in-house R&D and new product development capabilities. Some of the major North American service providers are expected to become more active in this space, leveraging their technology leadership and significant in-house resources. The main areas of opportunity here are seen as licensing technology and solutions, such as set-top box technology, OTT platforms and mobile-first products, to smaller pay-TV operators.

7 — INNOVATION PRIORITIES FOR THE PAY-TV INDUSTRY

As our research has demonstrated, innovation is becoming both more important and more achievable for pay-TV providers. During the remainder of the decade, we expect innovation to remain a top strategic priority for pay-TV providers around the world, as competition intensifies and opportunities proliferate, to broaden existing portfolios and to expand into new geographies. Increasingly, we expect the industry's innovation leaders to be recognised as amongst the most innovative companies in the world, in global innovation surveys and indices.

What steps do pay-TV providers need to take, to ensure that they are fit-for-the-future and well-positioned to innovate successfully? We believe they should focus on four main innovation priorities:

1. Establishing strong customer and market insight capabilities.

Like successful companies in other industries, pay-TV innovators will need to invest heavily in understanding their customers and the fast-changing markets they compete in, synthesising data and research from a broad range of sources to profile their subscribers, improve acquisition and retention, understand the commercial returns delivered by investments in content and services, and identify opportunities for innovation.

Sky, for example, one of the industry's innovation leaders, maintains a substantial Insight and Decision Science (IDS) team, providing specialist skills in data development, analytics, research, report development, decision execution, CRM, insight consultancy, software development and econometrics. The team is responsible for *"one of the most powerful, large-scale consumer data sets in the world, combining detailed consumer cross-platform viewing behaviours with transactions, interactions, profiles, needs, attitudes and preferences across a wide breadth of households"*. Specialist teams are also embedded in different business units, providing dedicated insights into areas such as customer service, marketing, competitor and market insight, content, products, media and trading.

Robust metadata, data and analytics platforms, skilled teams and strong business processes sit at the heart of robust insight capabilities, allowing providers to capture and analyse data from set-top boxes and multi-platform services, alongside datasets created by customer interactions with marketing and customer service channels.

2. Continue to deploy platforms and processes that can support faster innovation.

The latest pay-TV platforms represent a dramatic step-forward for the industry, supporting much more rapid service development and innovation than older legacy platforms. They are modular and scalable, support IP video and multitenant architectures and applications, and allow services to be developed and deployed cost-effectively across pay-TV platforms and broadband networks – CDNs, Unicast and Multicast, Docsis and FTTH, and public and private Wifi. They support delivery of complex service portfolios – linear broadcast, VOD, PVR, 4K, OTT – into a fragmented device universe, including advanced set-top boxes and a broad range of connected devices, both in and out of the home, and provide integrated, adaptive content protection and unified business services, analytics and intelligence.

The latest pay-TV platforms can be a powerful foundation for innovation – helping to reduce development costs, improving speed-to-market, and enabling the development of innovative new services. However, migrating to a new pay-TV platform can be expensive, time-consuming and risky. As a result, many operators are now segmenting their customer bases, providing a range of set-top box platforms to meet the needs of different customer groups and staggering the transition to a new platform over time. Although this can result in fragmentation, it can help to mitigate costs and risks – and allows users to determine the rate of adoption.

Importantly, advanced platforms alone are not the answer – pay-TV providers also need to adopt new business processes: lean, agile development methodologies, structured approaches to identifying and developing new ideas, iterative learning processes, and a strong focus on delivering new products that satisfy customer needs and solve real problems. At the same time, providers need to develop cultures that accept risk and failure, as an inevitable part of the innovation process, and encourage curiosity, debate and investigation: *"Pay-TV service providers need to implement a cultural mandate for innovation across their organisations. Fear of failure is a major innovation challenge across the industry, but if you can't fail you can't innovate. We need to put the right processes and incentives in place to encourage rather than limit innovation."*

3. Developing strategic partnerships with best-of-breed technology suppliers and start-ups.

As we have seen, almost all pay-TV providers rely on technology suppliers for some or all of their technology needs: 44% of pay-TV executives in our survey cite partnerships with suppliers as central to their innovation and new product development efforts[31] , and 55% believe that *"suppliers and vendors will be the main source of innovative new products and services for the pay-TV industry, during the next 5 years."*[32]

The best suppliers are strongly attuned to market requirements and have many years of experience supporting the development of innovative new pay-TV products and services. Although simple buyer-seller relationships can deliver some of these benefits, more strategically-focused partnerships, which involve mutual commitments, sharing insights and close collaboration over an extended period of time, can support the development of innovative products focused on a provider's requirements as well as insights into the market and the needs of customers. Successful partnerships can provide greater focus, enable collaborative ideation and lead to co-ownership of patents and IP and sharing of returns. In some cases, partnerships may take the form of joint ventures, to fulfil a core product need or develop an innovative new proposition, helping to deliver greater alignment and commitment – for example, to develop a new security technology or app portfolio. In other cases, collaboration may involve the pay-TV provider making a strategic investment, if the supplier is private start-up with valuable technology – many of the largest pay-TV providers have established corporate venturing arms in recent years and, in some cases, have acquired leading technology providers.

Successful partnerships can also provide valuable support for smaller-scale pay-TV providers. In some cases, suppliers have taken on the management of platforms on behalf of providers, leveraging their scale to engage with and secure deals with content providers, providing a populated platform and a managed service. In some markets, smaller providers have formed consortiums with vendors to support the collaborative development of new technologies, reducing fragmentation and helping to create a common market.[33]

4. Build collaborative partnerships with content companies to unlock new commercial opportunities.

The pay-TV industry is fundamentally focused on the provision of premium content – aggregating, packaging and providing high-quality film and TV content on highly-functional platforms and devices, providing subscribers with additional choice, control and convenience, over and above what is offered by free services. Although many pay-TV providers have diversified and broadened their service offerings, providing multi-play packages that combine TV with telecoms and other services, content remains an essential component of the bundle: *"Other services, especially broadband, are becoming more important for customer acquisition, but content is still king. Pay-TV providers don't want to become dumb, commodity pipes for OTT providers – content is key to adding value, differentiating your service and innovating."*

However, many pay-TV executives believe that content

[31]Question: Which of the following best describes your organisation's approach to innovation / new product development? (pay-TV service providers only, n = 61)

[32]Question: To what extent do you agree or disagree with the following statements about innovation and the pay-TV industry? (% of respondents indicating "strongly agree" or "agree"; n = 92)

[33]CI Plus LLP, for example, brings together Sony, NAGRA unit SmarDTV, Samsung, TPVision, Panasonic, Neotion and SMit to manage the technology licensing, testing and certificate procurement regimes for the extended version of the DVB Common Interface, known as CI+. Another example is the RDK programme that has attracted a large number of licensees.

prices, rights and inflexible working relationships with content companies are key innovation challenges facing the industry. Indeed, the industry is often characterised as a commercial standoff between content providers and pay-TV platforms, competing for margin and jostling to own the consume relationship.

In many respects, this is unfortunate. Although content providers do have other monetisation options, pay-TV providers are a substantial and reliable source of income, supporting high levels of investment in premium content and investing in advanced TV platforms that provide consumers with the flexibility and control they increasingly expect. Although some consumers do appear to want smaller packages and skinnier bundles, others clearly appreciate the value-for-money and consistent user experience provided by aggregators: *"Everyone's investing in direct-to-consumer services, but I'm not sure consumers want to subscribe to five different packages from five different studios, each with its own UX and billing system. If the industry heads in that direction, I think we'll end up re-aggregating and reinventing pay-TV."*
Furthermore, successful partnerships and collaboration between pay-TV providers and content companies appear to be critical, to unlock and address many of the most attractive commercial opportunities available to the industry – delivering new content products, features and functionalities on pay-TV platforms, developing compelling premium OTT offerings to expand the pay-TV universe, and realising the full potential of advanced advertising. Clearly, this will require flexibility and commercial experimentation by all parties – but the opportunities for growing the industry are significant.

There are few one-size-fits-all recipes for success, but industry executives cite five key priorities: clear communication about roadmaps and pipelines; collaborative working sessions to explore new opportunities; a willingness to share risks and returns; a willingness to share information, data and insights; and clearly-documented processes and procedures.

8 — ABOUT THE PAY-TV INNOVATION FORUM

The Pay-TV Innovation Forum is a new global research programme for senior pay-TV executives, developed by NAGRA and designed to explore and catalyse innovation across the pay-TV industry, at a time of unprecedented change.

The findings in this report were developed between March and September 2016 and are based on MTM research and analysis and extensive engagement with pay-TV industry executives from around the world. The research programme explores industry perspectives on:

+ Barriers to innovation in the pay-TV industry – and how they can be overcome
+ The strategies, products and services that will drive the next phase of growth for pay-TV operators
+ The critical success factors behind the most innovative pay-TV propositions
+ The capabilities that best-in-class operators will require to succeed in 2020

The research programme covered **42 countries** across four regions – **EMEA, North America, Latin America and Asia Pacific** – and consisted of four research stages:

1. Seminars with senior pay-TV executives
2. In-depth interviews with senior pay-TV executives
3. Original research and analysis, auditing pay-TV operator product portfolios
4. Online survey of pay-TV industry participants

Unless otherwise attributed, all quotations used in the report come either from in-depth interviews or seminars with senior pay-TV industry executives (held during Connected TV Summit in London, TV Connect in London, NAGRA TV Innovation Days in Rome, CommunicAsia 2016 in Singapore, NAGRA client events in Mexico City and Los Angeles, and ABTA 2016 in Sao Paulo). All sessions were completed under the Chatham House Rule (no attribution without prior permission), with participants speaking as individuals and not as company representatives.

Please visit https://dtv.nagra.com/paytvif for more information about the programme and future events.

Service provider portfolio scores

We have conducted a detailed review of pay-TV service providers' product and service portfolios globally. We analysed the product and service portfolios **of 231 service providers[34] across 42 major pay-TV markets:** Argentina, Australia, Austria, Belgium, Brazil, Canada, Chile, Colombia, Denmark, Finland, France, Germany, Hong Kong, India, Indonesia, Ireland, Italy, Japan, Malaysia, Mexico, Netherlands, New Zealand, Nigeria, Norway, Peru, the Philippines, Poland, Portugal, Russia, Saudi Arabia, Singapore, South Africa, South Korea, Spain, Sweden, Switzerland, Thailand, Turkey, UK, USA, Venezuela, and Vietnam.

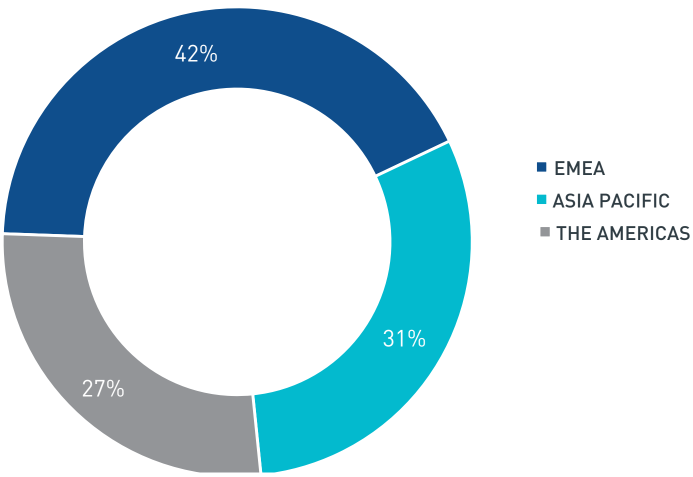
Our analysis focuses on video products and services – including the end-to-end TV platform and online video services, as well as adjacent products and services that are closely related to the core pay-TV offer – e.g. dynamic ad insertion solutions that deliver targeted advertising on connected set-top boxes or Smart Home solutions that are delivered through a common set-top box.

To assess the state of pay-TV provider innovation in the market today, we have scored the portfolios of a broad range of leading providers based on their sophistication and functionality. For example, within the core pay-TV offer, service providers have been evaluated based on the functionality and features available on their top of the range set-top box. Scores have then been weighted, to produce an overall portfolio score.

Online survey of industry executives

We have conducted an online survey with pay-TV industry executives, exploring their views on innovation and growth opportunities across the industry. The survey was conducted in July-August 2016, with respondents representing the following regions:

Exhibit 25: Online survey respondents by region[35]



[34]Service providers included in the analysis account for c. 576m pay-TV subscribers in total. The analysis covers: 1) Pay-TV service providers that have more than 100,000 pay-TV subscribers and account for more than 3% of all pay-TV subscribers in a given country, 2) Pay-TV service providers that are part of larger telcos.

[35]Base: all survey respondents (n = 92)

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