



The economics of IPTV – Making IPTV profitable

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- > IPTV as a walled garden application (as opposed to WebTV in the open internet) has seen notable subscriber growth in parts of Europe. This will continue in Asia and the Americas
- > The business models employed are highly diverse. Often they are specific to individual countries or even particular companies. Business models range from simple budget IPTV solutions to premium high-end offers in terms of content, features and supporting infrastructure
- > The middleware ecosystem enabling IPTV services is highly fragmented. However, only a handful of vendors are currently able to position themselves as future market leaders in terms of capabilities, flexibility and the required speed of implementation/customizing
- > Companies' motivation for launching IPTV is varied. High on the list of motivating factors are preventing churn, fending off competition, refreshing the company image, utilizing spare bandwidth capacity and creating additional revenue streams
- > While the underlying reason for pursuing IPTV often has a strong strategic component, its stand alone mid-term and long-term financial performance is what will eventually make it a success or a failure. Making IPTV pay off remains a challenge however: IPTV is not suitable for every operator
- > Roland Berger has extensive experience in strategic, operational, content-related and financial issues regarding IPTV. We can help you launch, optimize or re-launch your IPTV offer and help it along the path to financial success

1. IPTV – A true global success story?

Today, in the closing months of 2008, Internet protocol television or IPTV – TV content provided via a closed network, as opposed to "WebTV" which is offered over the public Internet (WebTV is the focus of another Roland Berger study published in August 2008: "WebTV insights and perspectives") – can look back on a short but turbulent history. Its story has been one of rapid growth, at least in certain countries. For the end of 2007 experts were estimating that IPTV reached over ten million subscribers worldwide. This number is still relatively small compared to a customer base of several hundreds of millions for all telecommunications carriers worldwide. Yet the fact remains that experts are forecasting an increase of over 500% in the global IPTV subscriber base, reaching 60 million by 2010. Driving this increase will mainly be the expected rapid take-up of IPTV in countries like China. Here, SMG (Shanghai Media Group) launched the first IPTV services back in 2005. By 2006-2007 growth rates were a stunning 900%.

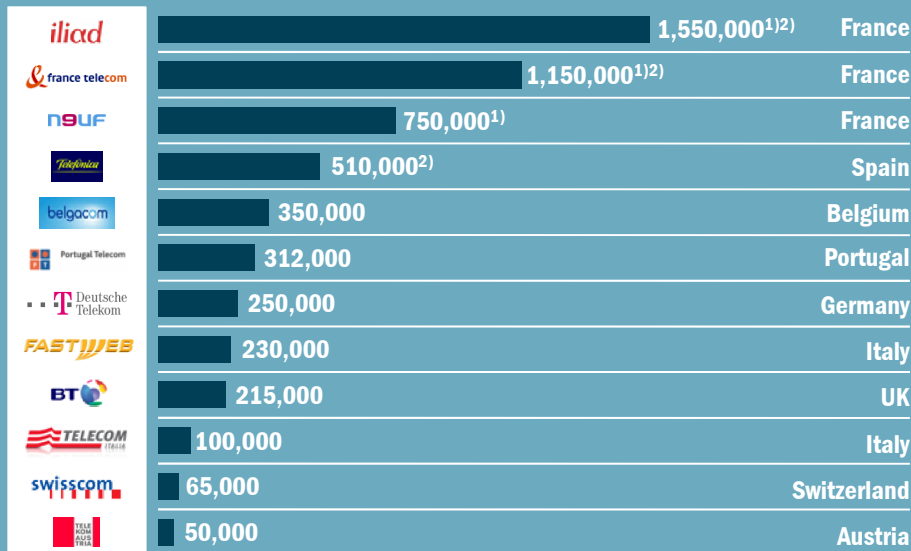
IPTV today is stronger in some regions of the world than in others. Western Europe accounts for around 55% of subscribers, while Asia accounts for 35% and the Americas for just 10%. Central and Eastern Europe (CEE) plays a minor role. The reasons for the success of IPTV in Western Europe are varied. Often they include an initial situation of general TV undersupply, stiff competition in the DSL and IPTV market (as in France, for example), high broadband penetration, few regulatory constraints and national or even international telecommunications operators with correspondingly large investment budgets. Examining Western Europe can reveal key drivers in the market and indicate best practices for successful IPTV products everywhere.

This study presents a detailed examination of the IPTV market landscape. It discusses our experience of how to make an IPTV product successful – from a widely neglected perspective. Current discussions on IPTV tend to concentrate on technology, gadgets, features, content and subscriber numbers. By contrast, we believe that generating sustainable stand alone financial returns in the medium or long term is what will ultimately make IPTV a success or a failure. For this reason we focus here on the key actions that companies need to take in order to make their IPTV business profitable.

1.1. The IPTV market in Europe – France as a role model?

The current European IPTV market covers the complete spectrum of offers, from "basic" TV over IP only (mainly free of charge) to fully fledged premium pay TV offers with maximum content and features. The market is also highly dynamic. Telecommunications incumbents, who are usually the first to introduce IPTV in their home markets, are constantly faced with the challenge of new players entering the IPTV arena. Moreover, the media business is unknown territory for them. It is smaller in terms of revenue and margins compared to the telecommunications market, and it is highly competitive. All in all, a tricky field to negotiate.

Figure 2: OVERVIEW OF THE SUBSCRIBER BASE OF SELECTED EUROPEAN PLAYERS (Q1-Q2/2008)



1) Direct customer relations, excluding indirect CanalSat subscribers 2) Q4 2007
 Source: Industry press research; Company information; Roland Berger research

The story is different for example in Germany. Here, IPTV has enjoyed a more moderate uptake in terms of subscriber numbers until now. Free TV penetration is high and pay TV plays a smaller role. German households by and large have access to satellite or cable TV (terrestrial TV accounting for only 6% of German TV households), which offer some 100 free channels and a wide range of pay TV channels. In Germany, therefore, the channel portfolio does not represent a unique selling point. Moreover, cable customers in apartment blocks often have no say in the choice of cable TV provider. These customers, like satellite customers, do not have any "felt" TV costs. As a result the market for paid services is mainly made up of cable and satellite PayTV customers, who can choose their offers independently and of those who are willing to pay for a second TV access.

In many countries initial high prices for IPTV offers forced customers to take IPTV bundled with broadband access and fixed-line access, presenting them with an all-or-nothing choice.

Some new IPTV services such as Video on Demand (VoD) and to some extent high definition television (HDTV) face increasing competition from existing infrastructure (satellite or cable TV) and will not be unique to IPTV forever. And the VoD libraries are often small, offering little variety.

Going forward, IPTV players in those countries where the number of channels is not the driving force will only have long-term potential for innovation and revenue if they can provide interactive and customized services and exclusive content for niche groups. They must clearly distinguish themselves from traditional TV offers and access infrastructure. However, seeing is believing: Customers will only change their consumption behavior once they experience the new products or services for themselves.

Taking France as a role model for the rest of the world would be overstretching the point. While IPTV has been successful here, the TV landscape is very specific.

1.2 Business models in Europe – One size fits all?

Before digging deeper into the reasons why telecommunications carriers deploy IPTV and how they can make a profitable business out of it, it is worth looking at some of the structural details of the industry.

The TV offer pyramid consists of three different categories: basic TV services, mid-range services and premium services. This categorization is based on the differences in the underlying technology required and the resulting costs, as well as the cost of content.

The pricing of IPTV offers is a good example of this. Current price differences between budget, mid-range and premium IPTV offers are by and large driven by the same two factors, the technological and the content costs. Over time, however, the technological differences will diminish. Pricing strategy alone will drive the segmentation of the market, with offers ranging from the mass market right up to the high-end segment.

Monthly prices for subscriptions – including DSL access and telephony but excluding additional buy-through packages – currently range from EUR 30 for budget services to EUR 70 for premium services. The decision about what type of IPTV to offer depends largely on a company's overall strategic objectives, as well as the existing and planned network infrastructure (DSL versus VDSL) necessary to enable premium features such as HDTV.

Budget IPTV offers are comparable to analog or digital multi-channel TV (largely free TV) with respect to their content and features. Such offers can typically be found in markets with a high level of terrestrial TV penetration. Revenue generation through additional buy-through packages is not the top priority. Instead, companies aim to retain and extend their DSL subscriber base. Features are mainly confined to single SD stream TV, some rudimentary VoD functionalities and maybe PVR. HDTV is usually not offered, due to the lack of bandwidth. As a rule, a bandwidth of around 4 Mbps is sufficient for enabling budget IPTV offers.

Mid-range IPTV offers usually compete with satellite pay TV in terms of their content and features. Typically they are found in strong cable markets. Revenue generation is driven by a range of additional paid services, such as buy-through packages and VoD. In addition to budget IPTV features, companies generally offer single HD stream and multiple SD streams, PVR functionalities and HDD STBs. The necessary band-width to allow smooth IPTV operation is 8-12 Mbps. Mid-range offers dominate the European IPTV landscape at present in terms of the number of players offering such services.

Premium IPTV offers are currently rare in Europe. They are positioned to be superior to satellite pay TV offers with respect to content and features. Premium IPTV offers include multiple SD and HD streams, catch-up TV, PiP, fast channel change, a wide variety of organized content (including VoD, buy-through packages) and STBs with PVR and HDD functionality, and much more besides.

The necessary bandwidth to enable premium IPTV ranges from 16 to 25 Mbps, making a high-performing network infrastructure (ADSL2+ or VDSL) a prerequisite. Revenue is generated through a high-priced 3 Play offer and an extensive range of additional buy-through packages. In the future, IPTV middleware will also enable comprehensive advertising capabilities, creating an additional revenue source.

Clearly there is no one-size-fits-all business model. The decision about what type of IPTV to offer – budget, mid-range or premium – largely depends on the company's overall strategic objective as well as the existing and planned network infrastructure. This, in turn, has implications on the potential means of generating revenue.

Figure 3: OVERVIEW OF BUSINESS MODELS

Budget IPTV	Mid-range IPTV	Premium IPTV
★ ☆ ☆	★ ★ ☆	★ ★ ★
<ul style="list-style-type: none"> > Competes with basic multi-channel TV, no "real" reason to move from satellite TV > Features: <ul style="list-style-type: none"> - Single SD stream or only VoD - No HD, no PVR > Subscriber bandwidth of 4 Mbps sufficient 	<ul style="list-style-type: none"> > Competes with satellite TV, similar offer, similar quality > Features: <ul style="list-style-type: none"> - Single HD stream, multiple SD streams - PVR, HDD STB > Subscriber bandwidth of 8-12 Mbps 	<ul style="list-style-type: none"> > Superior to satellite TV offer in features and usability > Features: <ul style="list-style-type: none"> - Multiple HD streams, PiP - HDD STB, catch-up TV - Fast channel change > Subscriber bandwidth of 16-25 Mbps
⇒ TV free with BB – Target terrestrial households	⇒ TV in package (triple/quad-play) – Typical strategy on strong cable markets	⇒ Premium TV with additional features – Target high-end segment

Source: Roland Berger analysis

1.3 IPTV middleware in Europe – The leaders of the pack?

Middleware constitutes the heart of IPTV deployment. It is also one of the key cost drivers of IPTV, as we discuss further below in more detail. Carriers planning to launch IPTV devote a significant amount of time to comparing and testing different platforms in order to find the middleware that best suits their purposes. A wrong decision in the beginning can not only cause delays in the launch but also constrain future targeted development of the platform, ultimately leading to additional costs for the carrier. Choosing an IPTV platform is therefore an important decision, and it is worthwhile taking a brief look at the middleware landscape as it appears in Europe today.

Some of the major IPTV carriers in Europe in terms of subscriber numbers – Iliad, Neuf Cegetel, Telefonica – originally developed their own middleware rather than relying on purpose-built solutions. Today, Neuf Cegetel still runs its own middleware. Iliad and Telefonica, on the other hand, have sold their platform to Alcatel-Lucent, who manage it on behalf of the carriers and are in the process of merging it with their own platform. In the future it is expected that IPTV middleware will be exclusively purpose-built rather than homegrown. The purpose-built middleware market in Europe is currently dominated by companies such as Microsoft, Alcatel-Lucent, Nokia Siemens Networks and Thales-Thomson.

Microsoft's Mediaroom middleware has managed to attract an impressive range of incumbent carriers in Europe including UK's British Telecom, Swisscom and Deutsche Telekom.

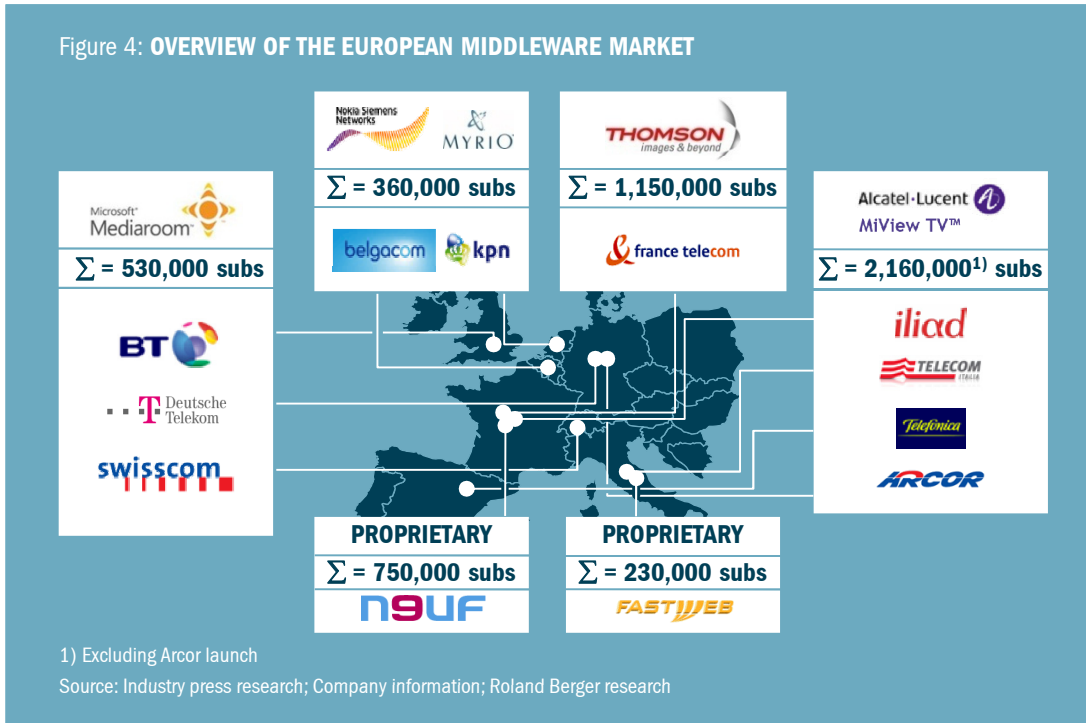
Alcatel-Lucent was among the first firms to offer IPTV middleware commercially. Today the company is the market leader in Europe in terms of subscribers and markets and manages two different platforms: its own MiView platform and Microsoft's Mediaroom platform (in cooperation with Microsoft). Alcatel-Lucent was also one of the first middleware providers to start buying up IPTV carriers' platforms (those of Telefonica and Iliad, for example) and merging them with their own platform.

Following its acquisition of Thales Broadcast & Media, Thales-Thomson gained ownership of the SmartVision platform. It successfully placed SmartVision with France Telecom in early 2000. However, this remains its only large-scale deployment to date. Nokia Siemens Networks has deployed its MYRIO platform with Belgacom and KPN. More recently, Ericsson has also entered Europe as an end-to-end IPTV integrator with licensed IPTV middleware from Kasenna, thanks to a deal with Greek OTE¹⁾.

Clearly the middleware market in Europe remains fragmented. There are numerous additional smaller players and various homegrown solutions on offer. However, Alcatel-Lucent has started the process of consolidation and this is a trend that is very likely to continue. The differences in features between different platforms that persist today will decrease in number within the next two to three years. The central selling point will become speed and degree of customizability and the ability/willingness of vendors to adopt to the IPTV operators' platform requirements rather than sticking to their own roadmaps often driven only by their biggest clients. Currently only few of the big platform vendors seem to adhere to these standards, often not even delivering their own roadmaps on time thus endangering the business models of the IPTV operators. A smaller, more flexible middleware vendor can be the better choice for some IPTV operators.

1) In fact, Ericsson already has one small end-to-end IPTV solution with Vodafone Iceland.

Figure 4: OVERVIEW OF THE EUROPEAN MIDDLEWARE MARKET



2. Reasons for launching IPTV – Defining success

IPTV is currently en vogue for telecommunications operators. However, the strategic rationale for launching IPTV is not always obvious. Neither is it clear how success should be defined.

Telecommunication carriers are branching out into IPTV for a number of different reasons. The motivation can depend on the market, the player category (incumbent versus challenger) and even the company.

In our client work we have encountered six strategic arguments underlying original investment decisions. Often a combination of arguments is involved. Interestingly, financial returns usually rank lowest on the list: Most companies with realistic business cases understand that the economic benefits of IPTV do not come easily – as we discuss in more detail in the next section.

Figure 5: REASONS FOR LAUNCHING IPTV

- | | | | |
|----------|--|----------|---|
| 1 | Prevent churn (mainly access) by value-added bundling | 2 | Extend revenue streams by entering content/media realm |
| 3 | Attack competition from cable on its own territory by adjusting the product portfolio | 4 | Refresh image by positioning the company as an innovation leader |
| 5 | Utilize bandwidth capacity generated by the rollout of high-speed broadband | 6 | Generate additional profit for the company |

2.1 Prevent churn – A magic wand?

Preventing fixed-line access churn is the reason that companies cite often for launching IPTV. IPTV is a value-added service that provides a range of bundling opportunities, raising the "churn barrier" for customers. However, making the IPTV investment reliant only on positive churn effects is a risky approach. Even though IPTV can without doubt have visible impact on churn reduction it is very hard to measure cause and effect after implementation. We have come across several business cases based on this line of argumentation.

2.2 Extend revenue streams – The new frontier?

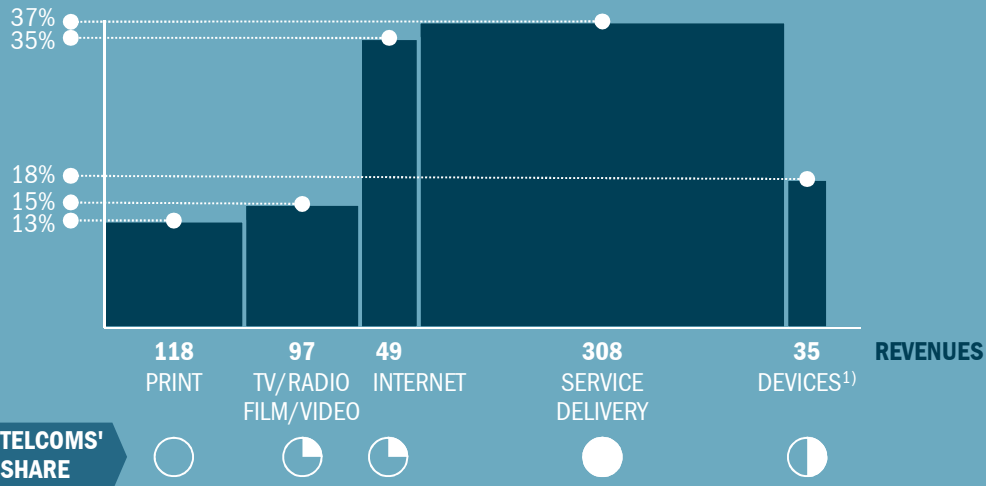
Some operators enter the IPTV business in order to establish a presence in the area of content, media or TV. However, they often neglect two factors in their argumentation. First, in comparison with the telecommunications market, the content, media and TV market that telecom companies can actually address is often rather limited. It is highly competitive and uncharted territory. Second, the focus on revenue growth in this segment is a double-edged sword. The margins that companies can generate in these markets are often significantly below typical telecom returns and gradual margin dilution can be expected.

2.3 Attack competition from cable – The ultimate weapon?

IPTV is giving telecommunications companies a long-awaited opportunity to strike back at cable companies and others menacing their position in the market. For some time, operators have been under attack from cable operators as they have moved from basic TV service into telecom services such as broadband and fixed voice telephony. Typically both traditional telecom and CaTV companies are present on customer premises – in the case of telecom companies for PSTN/ADSL, and in the case of CaTV companies for TV content/broadband. While CaTV companies have been able to extend relatively easy into telephony and broadband, telecommunications carriers have had limited opportunities for addressing the TV segment, for example through satellite. In markets with strong competition from CaTV, IPTV gives telecom companies a chance to "cut the cable" on their CaTV competitors and become the only ones present on the customer premises. However, to date few of them have looked at other strategic alternatives to fulfill this objective, such as direct-to-home (DTH) satellite TV.

Figure 6: EUROPEAN REVENUE FOR MEDIA, TELECOMMUNICATION SERVICES, AND CPE & MOBILE EQUIPMENT [EUR BILLION] AND EBITDA MARGINS [%] IN 2007

EBITDA MARGINS



1) Includes CPE and mobiles

Source: PWC; EITO; Thomson One Banker; Roland Berger research

2.4 Refresh image – The wind of change?

An argument that cannot be underestimated is the positive impact of a successful IPTV offer on a company's image. This is particularly true for incumbents. A sophisticated, high-quality IPTV offer can bring substantial benefits, replacing traditional customer perceptions based on voice services and technology with a message of "we have changed". However, bad product performance or poor customer service can easily undermine the benefits or have the opposite effect.

2.5 Utilize bandwidth – Content for the big pipe?

Sad but true: In some cases, companies base their launch of IPTV partly on arguments of the type "because we can". Although industry experts expect growth in bandwidth demand from customers, real bandwidth requirements of above 50 Mbps can only be argued for on the basis of high-quality content such as HD movies.

In many cases, large-scale investment in infrastructure such as VDSL has generated a need to populate the infrastructure with corresponding bandwidth-hungry services. This is done in order to drive often unproven customer demand at profitable price points.

2.6 Generate additional profit – The cash machine?

We have come across various arguments for launching IPTV based on the financial return it would generate. Unfortunately in many cases this return has been over-estimated and companies are left struggling to find additional resources for urgently needed investments. Many IPTV business cases are now conveniently forgotten, as they reveal significant gaps to real performance in terms of both revenues and spending.

3. Making IPTV profitable – Money counts

The underlying reasons for launching IPTV are diverse and often have a strong strategic component. However, we believe that stand alone financial performance is what ultimately makes IPTV successful or not. Whether launched to prevent churn, attack competition, refresh the company image, utilize spare bandwidth capacity or create additional revenue streams, to be truly successful IPTV operators have to manage to identify key focus areas that maximize the stand alone financial potential as a product, at least mid- to long-term.

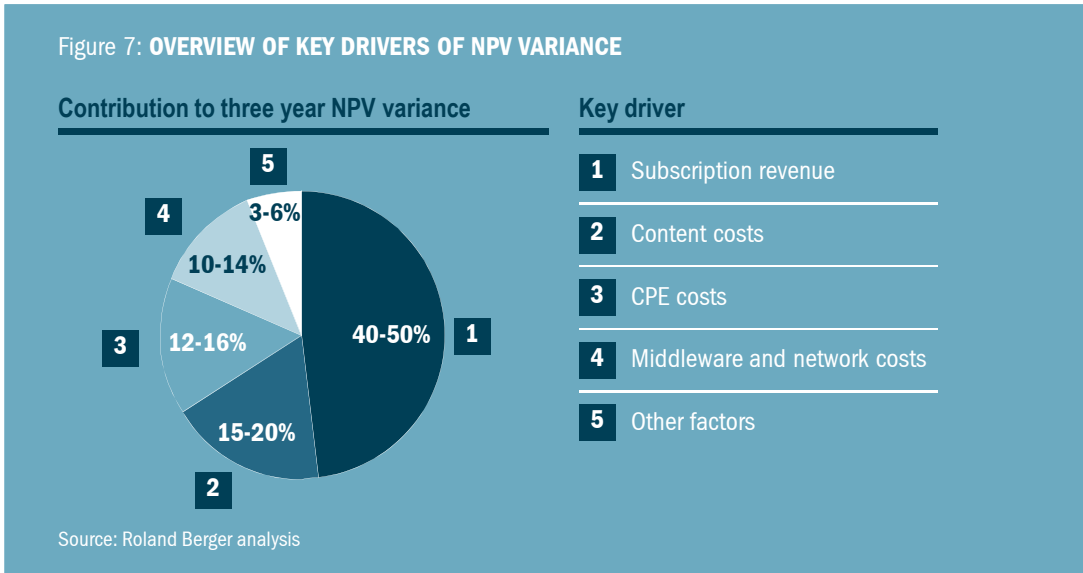
IPTV allows telecommunications operators to move into the media market. The technology offers great opportunities but it is still just a delivery mode – an entry ticket into the highly competitive media business. Telecommunications operators who want to enter this area must develop media competencies in order to compete. They need to negotiate with companies that have defined the media market, including content providers and cable operators, or take these firms on head to head. IPTV is not something for every telecommunication operator. From designing a TV product to making money in the media market is quite a journey. Telecom operators require a whole new set of skills.

Complex TV products have many options designed to encourage up-selling and buy-through of premium packages. TV products usually consist of a basic subscription and various buy-through options offered on top. Most of the buy-through options are bundled together as an "all you can eat" premium offer. Current trends involve the reduction of the basic subscription rate and increased flexibility of buy-through packages. Basic subscription is being reduced to local must-carry TV and free TV channels, to allow easier access to value-added buy-through packages. Pay TV buy-through packages tend to be as flexible as possible, allowing choices that range from à la carte channels to discounted premium bundles.

Below we take a closer look at the key drivers of a profitable stand alone IPTV product, one consisting of a basic subscription, various buy-through packages and a bundled premium offer. In this approach we follow the business models chosen e.g. by Iliad in France aiming to achieve high penetration of basic services first and upselling later. We identify key areas for this IPTV product by modeling IPTV deployment in full, based on our experience with several IPTV launches. In order to allow the assessment of long-term impact we predict possible future development scenarios by identifying the highest sensitivities on the three-year NPV. To this end, we examined more than 90 parameters as part of 10,000 Monte Carlo simulations of typical IPTV deployments. The ranges discussed relate to the aggregated result of this exercise. Parameters were evaluated based on their contribution to the three-year NPV variance, which shows the percentage of the forecast variance due to each assumption (e.g. subscription revenues account for 40-45% of NPV variance). This is based on computing rank correlation coefficients between every assumption and the three-year NPV. The sensitivity charts rank the assumptions from most to least important, based on their impact on NPV (through both uncertainty and model sensitivity).

The main area of focus for achieving stand alone profits is subscription revenue. This is followed by content costs, CPE costs, and platform (middleware) and network costs.

Figure 7: OVERVIEW OF KEY DRIVERS OF NPV VARIANCE



3.1 Subscription revenues – Capture the customer's wallet

While modern IPTV as a product can generate various revenue streams – Video on Demand and advertising revenue, for instance – the main contributor to the three-year NPV variance remains subscription to live TV programs. Our following discussions and analyses therefore focus on an IPTV product with a low basic subscription to get "into the living room" to achieve high basic penetration from the start and later upsell to more premium buy-through packages. Obviously, for products designed as "all you can eat" premium right from the start actual "basic" penetration of those packages has a much higher impact. For our chosen product design composed of basic subscription, buy-through packages and premium offers however, NPV is mainly driven by buy-through packages (both SD and HD channels).

3.1.1 Buy-through package penetration and pricing

Together more than 45% of NPV sensitivity to subscription revenues comes from buy-through packages (Figure 8). IPTV interactivity and proper design of the packages are the keys to increasing buy-through package penetration and maximizing profits.

For example this means that the impact of a change in package pricing (25-30%) in the analyzed business model has twice as high impact on NPV variance as premium pricing (12-15%).

IPTV interactivity empowers the product management to increase buy-through package penetration through tools not available to traditional pay TV: Improved methods of pushing content, enhanced by ease of ordering and superior customer profiling, can significantly increase buy-through package penetration. Programs can be pushed through interactive on-screen advertising triggered by certain user actions and on-screen promotional offers or program previews (e.g. opening up a channel for five minutes to specific customers). Ordering can be made easier by "one button push" subscription, for instance.

Customer profiling provides companies with precise information relating to customer activities. It allows targeted advertising, segmented content push and leveraging the community effect (e.g. "users that ordered this channel also ordered ..."). Customer profiling opens the door for correlation and advanced cross-selling techniques, such as those already used on the Internet. However, how companies use this data is subject to certain legal restrictions.

Proper basic content offer can increase customers' propensity to opt for value-adding buy-through packages. The basic package is usually presented as the minimum package the customer has to purchase in order to access the service. This ranges from must-carry TV to, in some markets, dozens of channels. It might be tempting to increase the content of the basic package and thus justify higher basic pricing in an attempt to increase ARPU. However, to do so would create an entry barrier to the higher value buy-through package for customers with narrowly defined interests.

Although the ideal composition of the basic package varies in accordance with viewers' interests, successful TV deployments give viewers themselves the choice. Companies can offer viewers a basic package consisting of must-carry and free-to-air channels at a price perceived as being almost free. In this way they create the lowest possible barriers to customers moving up to higher-value channels and making buy-through choices.

The interests of content providers drive companies toward including as many channels as possible in the basic package. After all, every provider wants as large a distribution as possible. Additionally, providers with one successful channel may make its distribution conditional on the inclusion of their other channels in the basic package. This often expands the basic package and creates barriers to specialized or exclusive content. Viewers interested in movies, for instance, have to purchase the basic package just to get access to the movie package. Should the basic package prove too costly, they may end up rejecting both packages.

While exploring additional revenue streams such as advertising and VoD, companies involved in IPTV should constantly check that their live TV package structure reflects customer preferences. Allowing users to choose specialized or exclusive content without the entry barrier of an overloaded basic package can significantly increase both overall IPTV and buy-through package penetration.

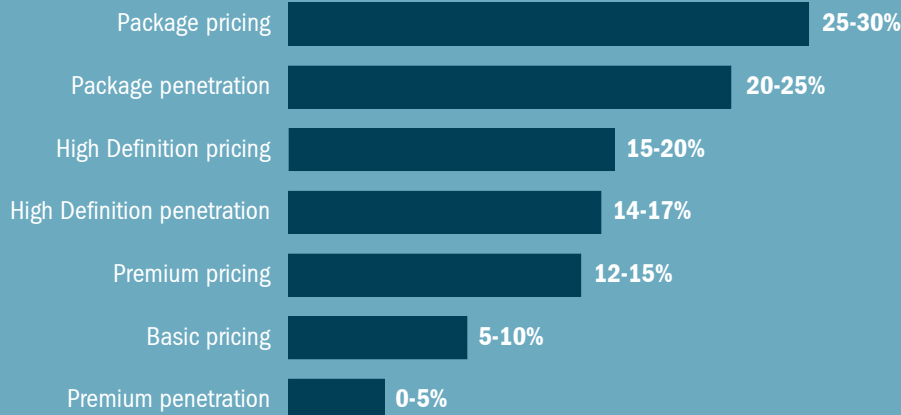
3.1.2 Premium packages

In the analyzed business model (see 3.1) premium packages are designed as bundled offers for premium users. These packages usually offer top-of-the-range content, functionality and options. This means exclusive content, HD versions, subscription Video on Demand, access to Video on Demand, catch-up TV, network PVR and so on. This is where IPTV really comes into its own.

Many features of premium packages have major cost implications, however. More expensive content, costlier platform licenses, higher network bandwidth requirements, more expensive STBs and residential gateways significantly increase the cost of premium packages. This can outweigh the superior revenue potential of premium packages.

Figure 8 shows how subscription revenue contributes to the three-year NPV variance. Premium penetration accounts for just 0-5%, the increase in revenues being almost completely offset by the costs incurred. Clearly, many business models peg the premium pricing too low.

Figure 8: **SENSITIVITY – HOW SUBSCRIPTION REVENUE CONTRIBUTES TO THREE-YEAR NPV VARIANCE**



Source: Roland Berger analysis

3.2 The ultimate offer – Content cost is key

As we have seen in figure 7, content makes a 15%-20% contribution to the three-year NPV variance. This makes it the key cost. Unlike traditional TV, IPTV can offer both linear and on-demand content.

Linear content is similar to traditional TV content. Here, telecom companies face the same tough negotiations that traditional TV broadcasters have been facing for years. Content providers push for high subscription fees, high minimum guarantees and channel insertion into the basic package to reach all viewers. Carriers can sometimes alleviate content providers' claims by demanding content distribution fees.

Subscription fees are usually charged per subscriber. They are high for a small number of subscribers and decrease as the customer base grows. Minimum guarantees hinder companies with low subscriber numbers and raise a barrier by requiring payments for a minimum number of subscribers. Subscription fees depend on inclusion in the operator's basic package, the package received by all customers.

Some content providers, especially those relying on advertising for a significant part of their revenues, push for inclusion in the basic package so as to improve rating points. Three options are generally available: inclusion in the basic package, extra basic, and à la carte. Inclusion in the basic package usually costs less per subscriber, but it forces the operator to distribute the channel to its entire customer base. Extra basic option offers the operator more freedom at a higher cost per subscriber. À la carte gives complete flexibility, usually at the highest price and with the risk of leaving value on the table by giving up bundling opportunities.

IPTV operators can leverage their increasing customer subscriber base by negotiating lower content prices and sometimes even demanding content distribution fees. Content providers that rely heavily on rating points are the most willing to pay content distribution fees.

The major linear TV costs in a typical IPTV package are the HD channel costs, the buy-through package costs and the basic content costs. Figure 9 shows the relative importance of each of these components in how content influences the three-year NPV variance.

Overall HD channel costs are greater than all other linear TV costs. For example, this means that a change in HD channel costs in the analyzed business model has an impact more than five times as high (55-60%) as the impact of basic content cost (8-10% on three-year NPV variance. This sensitivity will even increase as in many markets. HD will soon become a standard feature with no more opportunity to ask a premium for it. This is due both to growing demand for HD and high HD costs. In a competitive TV market, companies can use HD as a differentiating factor to gain key competitive advantages. With the explosion in sales of HD-ready and full HD TV sets in recent years and the relatively low current penetration of HD content, the hunger for HD content is growing. As yet, most existing content is SD, and HD channels are considerably more expensive.

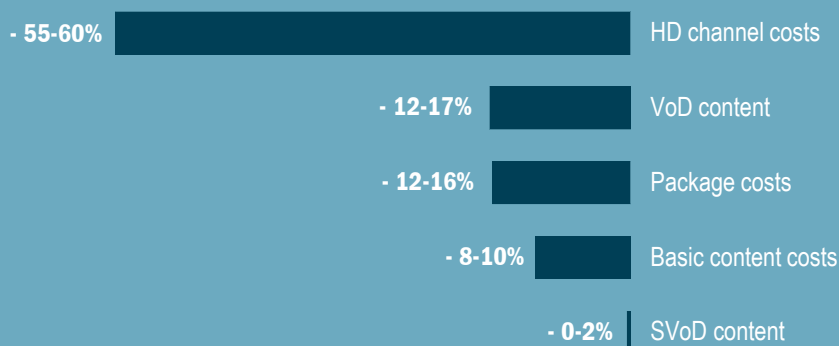
On-demand content is one of the distinctive features of IPTV. It has rapidly evolved from an additional "nice-to-have" option to a requirement for IPTV deployment. Content is usually stored on the provider network and provided to users on demand.

Content providers commonly impose a number of technical constraints and apply specific business models and conditions.

Technical constraints relate to the network's technical specifications. The operator's network and TV platform must meet the provider's security requirements. They must provide a closed network environment with certified conditional access and digital rights management systems. Technical specifications are often subject to third-party certifications or security audits.

Content providers negotiate the business model and conditions with the provider. This includes the payment model (revenue sharing, minimum guarantees, flat fees, fees per event), release window (delay and length) and support of on-demand content. Revenue sharing is the most common payment model, favored especially by major studios and for new movies. Revenue sharing can be as high as 70% for new releases and is usually coupled with minimum guarantees. Flat fees are found mainly for smaller studios, older releases or subscription Video on Demand (themed programs associated with linear TV programs). Major studios usually reject an advertising-based business model for recent releases, but both large and small studios will accept such a model for older releases and specially designed content.

Figure 9: SENSITIVITY – HOW CONTENT CONTRIBUTES TO THREE-YEAR NPV VARIANCE



Source: Roland Berger analysis

3.3 CPE policy – Direct correlation to bottom-line

Following content, the next most important influence on the three-year NPV variance is the cost of the customer premise equipment (CPE). Advanced equipment must be installed on customer premises to ensure video functionality (set-top boxes) and manage the underlying broadband connection (residential gateways). Set-top boxes can have internal hard drives offering PVR functionality. The analyzed business model assumes premium HDD STBs are not distributed to all customers but only to the premium segment (limited in addition by loop length constraints). The costs of CPEs are proportional to the number of subscribers and have a direct impact on customer profitability.

Typical CPE distribution policies are custody models (in which customers can use the CPE for the duration of the contract), rental agreements and sale. While sales of CPE generate immediate revenues, rental agreements can generate higher revenues over time. In established markets with high ARPUs, CPEs are provided free of charge for custody or included in the subscription. In custody and rental models, operators must pay special attention to the logistics arrangements for returning CPEs at the end of the contract.

Although HDD STBs provide obvious additional functionality, this has in fact already existed on the market for several years and is partly replaceable by network-based IPTV platform functionality (e.g. network PVR, catch-up TV). An aggressive market penetration strategy based on the basic service and relying on up-selling of different packages would focus on placing as many STBs as possible on customer premises. The companies Iliad and HK Telecom have successfully captured market share using this approach. Typical IPTV budget deployments rely on simple STBs with no PVR capabilities. In this case the impact of simple STB costs account for almost 90%: figure 10 shows the powerful impact of simple STBs on the three-year NPV variance.

Companies often use STBs to drive users toward higher value-added services. Simple STBs without HDD are common for basic services, while HDD STBs with PVR capabilities and extended features are usually reserved for top value-added packages. STB discount schemes also favor high-value packages, with discounts of up to 100% for top packages.

Figure 10: SENSITIVITY – HOW CPE COSTS CONTRIBUTE TO THREE-YEAR NPV VARIANCE



Source: Roland Berger analysis

IPTV uses the broadband infrastructure as support, and there is close cross-selling between broadband and IPTV. Many operators condition provision of the IPTV service on the broadband service. While IPTV might be the driver for broadband penetration, modem costs are often not directly attributed to IPTV and can be offset by the broadband service. Their influence on IPTV variance is thus reduced. Additional costs occur when IPTV subscribers do not opt for broadband connection (if this is allowed by the operator) or when the modems already in use for broadband do not have the necessary functionality to support IPTV (e.g. IGMP).

A successful approach will involve operators deploying IPTV-compatible modems for all broadband users, cross-selling IPTV and broadband, pushing for lower STB prices and fine-tuning the logistics for returning CPEs at the end of the rental period. The residential gateways required by IPTV are more expensive than the minimum modems required for xDSL. However, deploying residential gateways for broadband users provides an entry point for additional and substitute services such as IPTV and VoIP. Technologically, IPTV and broadband are prime candidates for cross-selling. Companies must target their marketing efforts carefully.

The latest compression algorithms – H264, for example – are highly complex and place major performance constraints on current STBs. This drives prices upwards. As technology evolves and matures, however, compatible STBs will become available from various sources and prices will begin to fall. Given the direct impact of STBs on the bottom line, operators should strive for excellence in their sourcing activities.

3.4 Middleware and network – The underestimated cash burner

For a traditional telecommunications broadband network to start providing IPTV services, considerable investments are needed both in the platform itself and in upgrading the existing network infrastructure. Different platforms place different demands on infrastructure. Network-agnostic IPTV platforms can be deployed quickly and easily, while various architectural trade-offs are possible to improve performance for network-aware platforms.

The investments in IPTV infrastructure (platform and network) mainly relate to the network. The sheer bandwidth required by video services means that the biggest share of investments goes into upgrading network transport capacity, down to the DSLAMs. The traditional DSL access and core networks used to provide best-effort broadband access require upgrading in order to provide the guaranteed bandwidth needed for IPTV.

The two types of services – live TV and content on demand – place different constraints on the various components of network infrastructure. Live TV network load can depend both on the number of live TV channels and on the number of subscribers. Content on demand, on the other hand, depends solely on the number of subscribers viewing the content at the same time.

Live TV is usually carried either solely as multicast traffic or as a combination of multicast and unicast traffic. Multicast traffic increases load in proportion to the number of live TV channels (multicast streams). Unicast traffic increases network load in proportion with the number of users watching content at the same time.

In the case of multicast, each channel is streamed once for all users across the entire core, edge and access network. Viewers of a specific live TV channel join the same multicast stream as other users, thus not increasing the overall network load. Adding a new TV channel increases the bandwidth requirements on the entire multicast domain, however. To support full multicast distribution, DSLAMs must be IP-aware (rather than blind layer-2 DSLAMs) and be able to perform channel replication (understand IGMP requests and replicate the right TV channels to individual users on the local loop). The multicast approach has the advantage of reduced bandwidth consumption and faster channel zapping.

In combined multicast/unicast transmission, channel replication is performed at a higher level inside the network, transforming the multicast stream into a unicast stream earlier on in the process. The live TV channel is carried as a combination of multicast and unicast traffic – multicast from the headend down to the edge router and unicast from the edge router to the user through the DSLAM.

Adding new users increases the load on the access network (from the edge router to the user), while adding new TV channels increases the load on the core and edge networks (from the headend to the edge router). This approach allows for easier network management and simpler DSLAMs, thus reducing DSLAM costs.

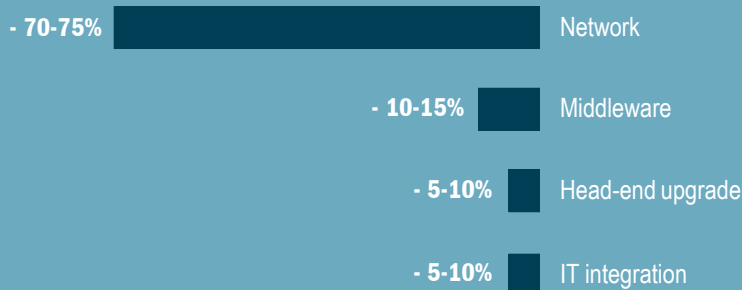
Content on demand (CoD) is generally different for each user and thus requires separate unicast streams. This means that each new user increases the network load. Adding more content does not automatically increase network requirements. However, the number of users concurrent directly impacts on network load. Core network load can be managed by installing content edge servers and moving some of the most popular content closer to the user consuming it.

Network upgrade sizing must therefore take into account a number of factors. These include the platform architecture (centralized versus distributed), the number of SD/HD channels, the CoD concurrency and the HD/SD bitrates. Depending on current bandwidth availability on the different network segments, architectural trade-offs can considerably reduce the costs. Figure 11 shows how much network upgrade investments impact on the three-year NPV variance for a typical telecom network providing up to 20 Mbps DSL. The investments only include bandwidth upgrades from core network up to the DSLAM – not the expansion of DSL coverage or local loop upgrades/shortening.

The content and CPE costs discussed above are mainly dependent on external providers – STB manufacturers, content studios and so on. Infrastructure costs, by contrast, are mainly dependent on the operator's current infrastructure. IPTV is an excellent means of filling available capacity, but it can prove a resource drain for under-dimensioned networks. Companies deciding whether to invest in the network must weigh the high bandwidth requirements of video services and their cost against possible alternative uses of bandwidth, if such exist. Pure bandwidth network upgrades are non-IPTV specific and can be reused.

As consumer usage patterns change, so does demand on network capacity. Operators offering IPTV can make various trade-offs between bandwidth and the installed equipment base. As content on demand becomes more popular, bandwidth requirements on core end edge network can be diminished by replicating content servers from the core to the edge servers. Access network bandwidth (down to the DSLAM excluding local loop) can be saved by minimizing the live TV requirements through multicast transmission mode and more intelligent DSLAMs.

Figure 11: SENSITIVITY – HOW INFRASTRUCTURE COSTS CONTRIBUTE TO THREE-YEAR NPV VARIANCE



Source: Roland Berger analysis

The middleware provides the entire IPTV functionality and must be closely aligned with the business model. Investing in middleware has less of an effect on the three-year NPV variance than upgrading the network, but it is entirely IPTV-specific and thus harbors certain risks should IPTV not provide the desired results.

The headend provides a live video signal to the entire network. Operators that already provide live video signals via some other technology (such as DTH) can upgrade their current headend for IPTV functionality. Headend acquisition or upgrade occurs at the start of the project for a given number of channels; it then increases step-by-step as more channels are added.

IT is essential for linking the different parts of the project together. It enables the operator to provide a seamless service to customers, including CRM, ordering and billing. Most IT costs are incurred at the start of projects, due to the integration work required. Later IT costs stem from service maintenance and change requests.

While IT integration's importance looks relatively low in our analysis compared to the "war stories" of many IPTV middleware integrations, the results are based on an average integration success without a major failure. In addition some IT integration costs are part of the middleware implementation (e.g. consulting services) item or are covered by internal resources where costs of integration are often not easy to separate or assign proper price tags. Obviously IT integration will play a more important role in terms of NPV impact e.g. for incumbents with very complex and failure prone OSS/BSS systems or when IT integration is not managed properly and fails to deliver expected results.

Other factors such as defining the correct processes, providing service and installation, and developing self-install packs, call centers and help desks are essential for the proper development of an IPTV service. While development, if properly carried out, accounts for just 3-6% of overall impact, failing to do so can have a significant adverse effect on financial results.

4. Conclusions – Eight lessons to be learned

A wide range of business models, middleware platforms and technical infrastructure options supporting IPTV finally represents an opportunity for telecom companies to enter the media market with some initial success in terms of subscriber numbers.

1. **Financial profit**, i.e. making IPTV as a product pay off financially remains a challenge.
2. IPTV is no **"silver bullet"** and not suitable for every operator. Whatever their strategic reasons for choosing to develop IPTV, companies must also pay close attention to the areas of subscription, content, CPE, middleware and infrastructure in particular to build the foundation for success and robust stand alone financial returns at least mid- to long-term.
3. For the business model of a basic entry product and later upsell analyzed here **subscription** revenues should be actively pursued through content pushing. This requires superior customer segmentation, ease of ordering and smart content bouquet design. Content can be positioned through interactive advertising and onscreen promotional offers based on customer profiles. One button push subscription can provide immediate rewards for marketing activities. The mandatory base package should not represent a significant barrier to higher value buy-through packages. Obviously for "all-you-can-eat" type of IPTV products overall package "basic" penetration is much more crucial.
4. **Content** costs must be carefully negotiated with content providers – especially for differentiating content, such as HD channels and on-demand content. As the customer base grows there will be opportunities for reducing the cost of content and even negotiating content distribution fees for rating-dependent content providers.

5. **CPE** should encourage IPTV penetration. Once established in the living room this can stimulate package buy-through by means of discount schemes and features. It can also be reused if loaned to the customer under a rental or custody agreement. Achieving excellence in CPE procurement will have a direct impact on the bottom line.
6. **Middleware** platforms have to be carefully selected based on their revenue generating features and different demands on infrastructure as well as the ability and willingness of the vendor to adhere to operators' requirements and change requests in a timely manner. Network-agnostic IPTV platforms can be deployed quickly and easily, while various architectural trade-offs are possible to improve performance for network-aware platforms.
7. **Infrastructure** must be properly dimensioned and architectural bandwidth equipment tradeoffs taken into account. Core and edge bandwidth can be traded for CoD servers and access network bandwidth for more intelligent DSLAMs. Network load is strongly influenced by product managers' ability to stimulate certain kinds of CoD.
8. Telecom companies inherently have some of the **skills** required for running financially successful IPTV operations. However, they also require skills that are much more specific to the media and TV market. They typically lack skills of this type. To ensure success in IPTV, they must effectively close the expertise gap.

5. Roland Berger expertise in IPTV – How we can help

Thanks to numerous international IPTV projects, the InfoCom Competence Center at Roland Berger Strategy Consultants has acquired substantial strategic, operational and financial expertise in launching, optimizing and re-launching IPTV portfolios. We offer our clients comprehensive support in the following areas:

- > **IPTV strategy and business case:** We have the relevant experience to design actionable IPTV strategies. This experience comes from in-depth market analyses of all major European countries, competitive assessments (including Web TV and DTH satellite offers and realistic market entry or re-launch business cases based on operational benchmark data) and a deep technical understanding of the underlying cost implications
- > **IPTV optimization and operations:** We have helped operators fine-tune their IPTV offers and increase market success. Our work has included process optimizations and quality plus efficiency initiatives in technical and customer service, content portfolio and cost optimizations, and optimizations of customer touch points
- > **Full-scale IPTV re-launch:** We take a rigorous approach to re-launching IPTV offers that have not lived up to expectations. Here, our work has included setting up and managing an IPTV re-launch program, redesigning go-to-market plans, and implementing best-in-class technical and customer service processes and operations

If you wish to discuss any of the issues raised in this document or have any other questions, please call us on +49 (0) 89 9230 8037.

We look forward to hearing from you!

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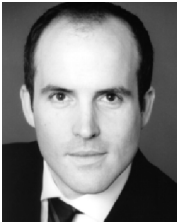
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List of abbreviations

ADSL:	Asymmetric digital subscriber line	HDTV:	High-definition television
ARPU:	Average revenue per user	IGMP:	Internet group management protocol
CaTV:	Cable television	IPTV:	Internet protocol television
CEE:	Central and Eastern Europe	Mbps:	Megabits per second
CoD:	Content on demand	NPV:	Net present value
CPE:	Customer premises equipment	nPVR:	Network private video recording
DSL:	Digital subscriber line	PIP:	Picture in picture
DSLAM:	Digital subscriber line access multiplexer	PSTN:	Public switched telephone network
DTH:	Direct-to-home (satellite service)	PVR:	Private video recording
EBITDA:	Earnings before interest, tax, depreciation and amortization	QOE:	Quality of experience
EPG:	Electronic program guide	SD:	Standard definition
FTA:	Free-to-air	STB:	Set-top box
H264:	Advanced video codec	UGC:	User-generated content
HD:	High-definition	VoD:	Video on demand
HDD:	Hard disk drive	VDSL:	Very high speed digital subscriber line

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