

The Future Role of Cable in Shaping the Digital Home in Europe



Liberty Global Policy Series

The Future Role of Cable in Shaping the Digital Home in Europe

by Booz Allen Hamilton

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I. EXECUTIVE SUMMARY

Shaping the Digital Home in Europe—Key Takeaways

- After broadband and Telephony, TV distribution is the next market being hit by the digital revolution and being challenged by new competitors such as telco operators
- Digital TV can be expected to overtake broadband within the next five years in terms of household penetrations in Europe—becoming the driving force of the development towards the Digital Home and an inclusive digital society
- The development of the Digital Home brings significant benefits to the consumer: More choice, more control and better entertainment value—advanced markets show: Consumers adopt the new services fast once they understand their benefits
- The competition will be increasingly based on multiproduct bundles (TV, Internet, Telephony) that cover all household needs leading to one unified Digital Home market
- Scale will be increasingly important in the convergent competitive landscape as it allows to sustain the necessary upfront investments to build a competitive edge
- Telco incumbents will be in a good position to dominate the Digital Home market since they are by far the largest players in this space dominating cable TV competitors by a factor of 1:10 or more
- Nevertheless, in many markets cable TV operators will be the only credible contender to challenge telecommunication incumbents
- The upside of an accelerated path towards the digital home is significant: Cumulative investments of up to € 100 billion until 2010 would lead to the creation of 100,000 new jobs
- Thus the development of the Digital Home—largely driven by the DTV development—will prove to be a key enabler to implement the EU i2010 agenda
- Cable TV operators would become the most important job engine accounting for over a third of all jobs created by infrastructure providers
- Delaying the digital home market bears significant downside risks—cumulated investments of € 39 billion and close to 90,000 jobs could be lost or delayed
- To secure an accelerated path towards the Digital Homes in Europe policy makers need focus on four key areas:
 1. Refocus attention from broadband to convergence/DTV
 2. Ensure a balanced market structure and competition
 3. Balance consumer protection with long-term investment and employment objectives
 4. Rebalance regulation in favor of infrastructure-based competition

Creating the Digital Home in Europe

The digital revolution is progressing at an ever-increasing pace despite a somewhat slow start in most European countries. Consumers are shifting their time and spending budgets in favor of new, digital media. Driven by a steadily increasing base of PCs and broadband connections, the way consumers retrieve information, receive entertainment, and do their shopping has changed dramatically in most Western economies: Consumers spend more time online than reading newspapers or magazines; close to 50 percent of consumer hard- and software is already bought online in the United States; and in the United Kingdom and Germany one out of five music CDs will be ordered via the PC this year.

Now the next important segment of everyday life is being radically transformed by the digital revolution: Television. Although certain European countries such as the United Kingdom, and to a lesser extent, France, are making significant progress in terms of digital television penetration, international market comparison shows that the EU as a whole is lagging significantly behind other regions, most notably the United States and some Asian countries, in terms of penetration rates and service availability.

More than 50 percent of U.S. households already receive digital TV services, with no slow-down in growth on the horizon. This compares to a European average of only 20 percent. Our analysis of the developments in more advanced markets as well as in Europe suggests that the development towards Digital TV (DTV) will be one of the most important drivers of innovation and growth in the information and communication technology (ICT) sector: (1) DTV per se will soon be one of the largest growth segments in the ICT market. (2) DTV will provide a platform for growth for the local content industry leading to a diversity in programming never witnessed before and (3) DTV as the pre-eminent mass media and technology will prove to be the key for digital inclusion, opening the full potential of interactive services to parts of society that otherwise may remain excluded from a purely PC-based digital world. (4) Last, but not least important, DTV will act as a catalyst for convergence reshaping the competitive landscape for communication and entertainment services enabling significant economic growth and employment.

Our Midterm Vision: The “Digital Home 2010”

Despite the ever-increasing pace of change, clear signposts of the future landscape are emerging: Connecting the data points from our research in more advanced

markets with sophisticated economic forecasting models, we developed a robust midterm vision for what we call the “Digital Home 2010”. This outlook of the future development is meant to support the thinking of decision makers in the industry and in regulatory bodies.

In the next five years most European households can be connected to advanced communication services, including both broadband internet and Digital TV. In fact, we expect that by 2010, Digital TV will already have outgrown broadband internet. Consumers will benefit from this development in many dimensions: Increased choice and quality and better control and interactivity will revolutionize the TV experience of tomorrow. The majority of European consumers will have access to a diversity of programming unheard of today in most parts of Europe. Since 2000 the number of available TV channels available in Europe has doubled to a staggering 1,600 channels—in the most advanced TV market in Europe, the United Kingdom, consumers can choose between more than 400 TV programs. But it is not just about quantity. Consumers also have access to higher quality content: From premium sports or movies to leading documentaries and European and local content programs. In addition, higher-quality content will increasingly be offered in better picture quality based on High Definition TV (HDTV) technology. Steadily increasing HDTV adoption rates in the United States and Japan as well as an increasing demand for HDTV sets in Europe underline the consumer interest for these services. Moreover, consumers will be in better control of their viewing experience. Interactive Program Guides (IPG) will help them to navigate through the plethora of available content. In addition, a lot of content will be offered “on demand” or can be easily recorded on a Personal Video Recorder (PVR) and retrieved at a time convenient for consumers.

Again, market experience in the United States suggests that consumers will readily adopt the new services, once they become available: Gemstar, the leading IPG provider—available to 12 million homes in the United States—reports usage numbers that match the total usage of private internet users in the United States. Comcast, the leading U.S. cable TV (CATV) provider, expects to see more than 1 billion on-demand sessions on its network this year—more than 20 sessions per active subscriber per month. Last, not least, TV will become interactive allowing consumers to react and interact directly using buttons on their remote controls. Apart from purely commercial and entertainment services, the interactive development also provides an opportunity for T-government and other information services to reach out to a much greater number of homes. Since August 2004, interactive TV allows

Community Channel viewers in the United Kingdom to donate money to a number of different charities via the set-top box on their televisions. One of the greatest successes was the Tsunami earthquake appeal in December 2004, which has managed to raise in excess of 1.25 million pounds so far. Similar developments can also be seen in some Asian countries and in the United States, where for example, material from the Democratic and the Republican National Conventions as well as presidential debates was available on Video on Demand (VoD) to 20 million homes.

Evolving Competitive Landscape for the Digital Home Market

Not only will the services on offer change, but the way they are marketed and delivered to the consumer will change as well. The majority of Digital Homes will be able to receive the video and TV services described above together with broadband internet and advanced telephony services from one single provider. In advanced markets that lead the development, consumers will have a choice of providers to buy the services from—in most cases telecommunication providers and CATV operators—and with that also a choice of technologies (Hybrid coax/Fibre vs. Digital Subscriber Line DSL). The infrastructure providers will take a very important and proactive role in shaping this new convergent market environment. The development in broadband in Europe has already shown that countries with strong, infrastructure-based competition frequently take the lead in terms of overall household penetration of these services. And as in other infrastructure-based businesses, their investments will pave the way for other market participants, such as technology, equipment, and content providers, to prosper.

All providers of telecommunication infrastructure, including the former telecommunication monopolists, are jockeying for position to serve the Digital Home market. That means they are investing to provide so-called triple play services (telephony, internet, and TV services)—adding whatever part is missing to their portfolios. The main motivation differs substantially, however. Whereas CATV operators and alternative telco providers look at the Digital Home market primarily as a way to grow their business, typically, for telecommunication incumbents, defensive considerations prevail: With their fixed telephony business already under attack from mobile services, unbundled local loop (ULL) providers, and the digital telephony services (VoIP) offers from cable operators, they see video services including TV not only as a potential growth avenue, but as an effective means to defend their customer base by preventing alternative players with alternative infrastructures to capture their customer relationship.

Experience from other markets shows that consumers are quite willing to source all services (i.e., TV, broadband internet, and telephony) from one supplier if the bundle on offer is attractive. The implications for the evolving competitive landscape are twofold: First, it will become increasingly difficult to compete for the Digital Home unless a provider is able to offer the full suite of services. In the midterm that leaves CATV operators as the only credible contenders to telco incumbents. All other players are competing on a technology basis (e.g., DTH and DTT—digital satellite and digital terrestrial distribution technologies) that is not (yet) capable of delivering triple play services. Second, size will become increasingly important as a competitive factor, as digital services provide significant economies of scale. To put it simply: the larger the subscriber base served, the higher the margins to be gained—and this increases the capability to reinvest in upgrading networks, building alternative platforms, and bidding for high-quality content to further improve the competitive advantage. Reaching scale is also vital in becoming an attractive partner for other players in the Digital Home value chain (like content providers) and is fundamental to foster confidence in new business models. The vital role of sheer size and scale clearly puts the former telecommunication incumbents in the pole position in the race for the Digital Home market. In most markets incumbents such as Deutsche Telekom, France Telecom, BT, or KPN outsize their largest infrastructure-based CATV competitor in terms of revenues generated or subscribers served by at least a factor of 10 to 1.

Challenges for Regulators in Supporting the Digital Home 2010

Technological developments, competitive moves, and consumer preferences are changing many underlying assumptions of the current regulatory regime at an ever-increasing speed. For example, distribution was traditionally regarded as a bottleneck, resulting in regulators taking a protective stance towards content providers to distribute their content. This has changed in the Digital Home environment: spectrum availability and bandwidth is less of an issue. In fact, there might well be an oversupply of distribution capacity and an undersupply of content. To protect consumers, price levels have frequently been regulated, and consolidation in distribution has often been prevented. In the Digital Home era, however, consumers can choose between different media distributors, and prices will increasingly be regulated by market forces. Continuing with the existing regulatory frameworks of the past may significantly hinder the advancement of the Digital Home, ultimately putting industry growth and consumer satisfaction at risk.

Regulators on the national and EU level have started to acknowledge that competition will increasingly take place in a convergent market environment and are trying to understand the implications for the regulative regime. On the EU level, important public policy and regulatory initiatives have been introduced to address the converging market environment, such as the introduction of the i2010 agenda, policy initiatives to bridge the digital divide, the communication on accelerating the transition from analogue to digital (terrestrial) broadcasting, and the application of competition policy principles on access to (and exploitation of) content (rights) for different distribution platforms. Going forward, the forthcoming revision of the Television without Frontiers directive (TVWF) and the review of the regulatory framework for electronic communications networks and services (NRF) in view of “next generation networks” as well as the review of the list of relevant product and services markets as recommended by the Commission under the NRF will further reshape the regulative framework at the EU level.

Yet, most policy makers and regulators at national level are struggling to implement coherent midterm public policies and regulatory instruments to keep pace with the technological and market developments ensuring a fair and level playing field for all companies willing to invest in that area. The EU Commission has already taken a first step in the right direction by entrusting one Commissioner with the responsibility for both Information Society and Media. As such this Commissioner is effectively the Commissioner for convergence. However, most European countries continue to regulate media and telecommunications without much coordination among authorities, which often makes regulation and policy making in the convergent world extremely challenging, and vulnerable to wrong decision making.

“Digital Dividends” of the Digital Home Market

Booz Allen Hamilton has undertaken extensive research and analyzed the future market development of Digital Homes across Europe applying state-of-the art scenario techniques. The results are encouraging, but also reveal an urgent cause for action. Assuming a favorable economic climate as well as supportive regulative regime, the gains (“Digital Dividends”) to be achieved from the development towards the Digital Home are very significant:

- More than 60 percent of European households can be served by Digital TV services until 2010
- By then Digital TV can be expected to overtake broadband in terms of household penetration—

making Digital TV the main enabler of an inclusive digital society

- Cumulative investments of Euro 100 billion would be deployed by the industry to enable the Digital Home environment until 2010
- Close to 100,000 jobs will be generated, with CATV being the strongest job engine
- Local content could expect significant growth, with Euro 35 billion being spent on programming until 2010, driven by DTV proliferation

There is certainly a lot to be gained by enabling this favorable environment, but there are some barriers to be overcome. A lot of different players along the value chain need to align their strategies and business models to ensure that all players will be rewarded according to the economic risk. But our analysis clearly shows that the most important enabler will be a balanced regulative regime ensuring a level playing field for all players willing to invest against this opportunity. Almost two-thirds of the total investment needs to be carried by network operators. These investments are going to trigger significant knock-on effects, for example, in the area of content development and home equipment innovations. Therefore, ensuring fair competition on the infrastructure level rewards special attention. Looking at the broadband development across Europe as well as at the development in more advanced DTV markets like the United States, a clear lesson can be learned: Only a balanced and infrastructure-based competition will secure a fast and sustainable market development. Countries with significant infrastructure-based competition for broadband connections, for example, from CATV, enjoy faster overall penetration rates and typically give better value to consumers for their money. The same can be expected when the competition for the Digital Home unfolds: Only if more than one competitor will be able to offer comparable triple play offers to the consumer, market dynamics similar to what can be seen in the most advanced broadband markets, such as Belgium or the UK, will be unleashed.

This also implies a significant risk for regulators. If infrastructure investments are not being encouraged and—to a reasonable degree—also protected by the regulative regime, significant delays can be expected. Almost half of the cumulative investment—close to Euro 40 billion—would be delayed or lost altogether in Europe if significant regulative barriers remain in place or additional ones are created. The impact on the job market would be even more severe: 90,000 out of the 100,000 jobs to be generated in the convergent industries could be delayed or lost.

Recommendations for Policy Makers and Regulators

The stakes are high to get it right—both policy makers and industry players need to act decisively. On the basis of our analysis, we see four key themes for regulators to focus their attention on.

1. Refocus attention from broadband to convergence/Digital TV

To date policy makers and regulators have by and large focused on broadband to drive their digital economy objectives. Our analysis shows that Digital TV becomes increasingly important and can be expected to overtake broadband penetration by 2010. As Digital TV becomes the main enabler of an inclusive digital society, a more balanced policy perspective on broadband and Digital TV is justified. Policy makers and national governments need to realize the importance of the analogue to digital migration and, hence, should support migration efforts initiated by industry players.

2. Ensure a balanced market structure and competition in a convergent digital world

To ensure a balanced market structure, policy makers need to reflect the convergence of TV, broadband, and TV markets. The relationship between different horizontal markets (e.g., TV distribution and broadband), including the increasingly stronger interdependencies, needs to be taken into account. What seems to be a position of significant market power (SMP) in one market today can be easily dwarfed tomorrow by the entry of a competitor 10 times the size and economic weight. Also, the interplay across the value chain, in particular between infrastructure operators and content providers, needs to be brought (or kept) in balance. Traditionally, near monopolistic market structures in distribution put the platforms into an advantaged position, and they were thus prevented from entering the content market. But it is time to rethink this dependency in the convergence space because distribution will no longer constitute a bottleneck. Today's changing reality paves the way for a new relationship and integration of content and distribution with only extreme cases of unfair blocking of platforms or unfair treatment of own versus other content required to be regulated. Thus, regulatory decisions concerning vertical and horizontal consolidation need to bear these new market realities in mind. Consolidation in the industry will be required in most European countries to enable fair competition. As such, the convergent market poses a particular challenge to regulators because frequently the Digital Home market is regulated by

different authorities (e.g., one regulatory body for telecommunications, another one for media) under different policy objectives. However, the convergence of TV, broadband, and telephony will require much closer coordination—if not even a merger—between different regulatory bodies and the definition of new strategic industrial policy objectives supported by a broader set of coherent public policies.

The shift from analogue to digital TV is a risky challenge for all industry players; any unequal support of technologies and/or platforms may lead to an imbalance in industry structure and a slowdown of overall market development. Hence, policy makers should therefore support rapid consumer migration to the Digital Home regardless of the technology of the distribution platform, for example, through publicity campaigns or clear analogue switch-off dates. As such, support for digital switchover should be technology neutral.

3. Balance consumer protection with long-term investment and employment objectives

Policy makers face the challenge of balancing short-term consumer interests (e.g., low prices) with midterm objectives concerning economic growth and employment. For the regulator, the need to support this balance drives the need for a coherent regulative framework across services (TV, broadband, telephony), distribution infrastructures (cable, DSL, satellite, terrestrial), as well as along the value chain (content versus distribution). When making decisions on positions of significant market power or on consumer protection, policy makers need to make a trade-off of short-term gains against positive long-term effects on investments, jobs, and industry structure. They need to ensure that short-term remedies (e.g., price regulation, network access) do not prevent investments in long-term growth, which would lead to significant distortion of fair market competition.

4. Rebalance regulation in favor of infrastructure-based competition

Policy makers should stimulate infrastructure competition rather than focusing too strongly on service-based competition to foster consumer choice because infrastructure-based competition leads to the best results in terms of investments and technological innovation as well as in-country job creation. Increasing service competition on distributors' infrastructure will deter them from making significant upfront infrastructure investments because they may not be able to earn an adequate

return on those investments. As infrastructure investment is reduced, so too will be the overall penetration of the Digital Home. Because the Digital Home is far more than just another entertainment fad, the impact of a slow penetration is immense: substantial investments in digital content and new businesses are delayed, small and medium-sized enterprises are deprived of up-to-date communication features, and the digital inclusion is not realized to the extent possible. In addition, regulators need to be aware that service competition on a network may lead to degradation in quality of service both to the service provider's customers and to the infrastructure provider's customers. Opening up networks to third-party service providers may also limit the effective protection of content rights.

Recommendations for the Cable Industry

In turn, industry players need to adapt to the new realities to drive the development of the Digital Home. Today, the cable industry finds itself in a consumer product market in which companies have to cater for diverse and fast-changing consumer needs. And for every one of these products, several credible competitors try to secure their part of the market. To successfully drive the development of the Digital Home, cable operators thus face three key challenges: (1) Making large upfront investments, (2) Capturing

the mass market quickly, and (3) Changing revenue streams. To address these challenges and to take a lead in driving the Digital Home, cable operators should act on six strategic imperatives:

1. Understand the Customer: Develop Consumer-Driven End-to-End Entertainment Offers
2. Serve the Entire Digital Home: Offer Compelling Bundles
3. Convince Consumers: Build Marketing and Sales Capabilities
4. Give Consumers What They Want: Proactively Migrate the Customer Base to Digital
5. Size Matters: Build In-Country Scale
6. It's a Team Play: Build New Business Models and Partnerships for Superior Digital Services

Regulators are challenged to secure a level playing field and investment security for all players willing to invest to make the Digital Home a reality. Once this is granted and all players take advantage of this market opportunity, Europe will look at a very exciting decade of moving into the digital age.

II. CREATING THE DIGITAL HOME 2010 IN EUROPE

1. Vision of the Future: The Digital Home 2010

Digitalization and convergence are no longer buzzwords but have become business reality: communication and media industries continue to experience rapid technological innovations in digital services, digital distribution networks, and end user equipment; television distribution technology is increasingly shifting from analogue to digital; and industry players are introducing more and more services expanding their traditional offering into the domains of different competitors. All these developments support a fundamental trend: the digital

The digital convergence of TV, broadband, and telephony infrastructures is the basis of the development of the Digital Home 2010

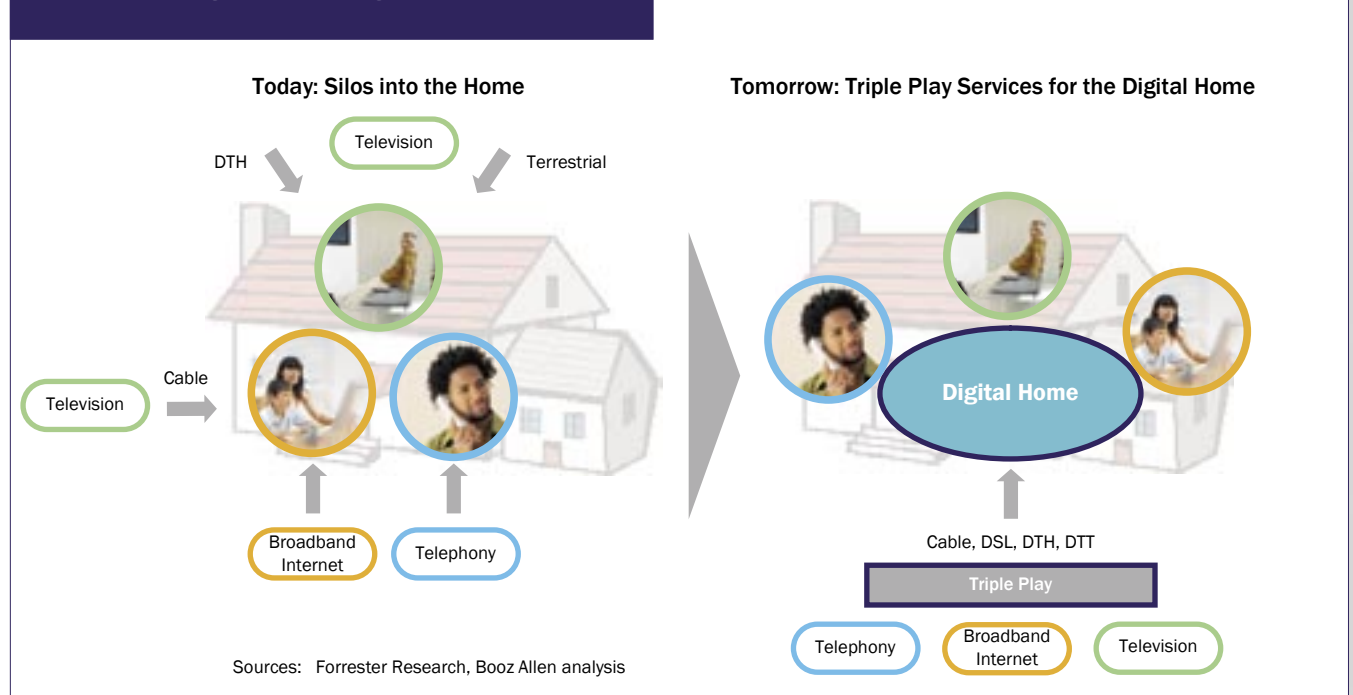
convergence of entertainment, communications, and computing into a feature which we call the “Digital Home”.

Convergence will predominantly have the effect of boosting infrastructure competition by allowing multiple distribution platforms to enter the market for the delivery of digital TV, broadband, and telephony services. These services, which were previously provided as distinct services via different distribution networks, are increasingly becoming available to digital homes in Europe in the form of multiplay bundles, delivered

over a single, high-speed distribution infrastructure (Exhibit 1). Consumers will consequently have the choice between different distribution platform providers, such as cable, telecommunications, satellite, or terrestrial distribution players, who will aim at providing a suite of comparable entertainment, communication, and information services to the Digital Home, thereby threading into each other’s former core markets. What the industry has been discussing for the past 10 years is finally becoming a market reality. Consumers in Belgium can already choose a complete TV, broadband, and telephony package (triple play) from their cable operator (e.g., Telenet) or from the telecommunications incumbent Belgacom. Similarly, French consumers can subscribe to triple play service offers from cable operators (e.g., UPC Noos) or France Telecom. To bring a series of new digital services, such as interactive TV, VoD, or interactive gaming to the home, strong digitized distribution infrastructures are required.

The provisioning of millions of homes with converging services implies huge upfront investments in infrastructure upgrades and in building alternative infrastructures. To recoup these fixed costs, network operators will push very hard to market their offerings and achieve high penetration rates. This operator push is important for overall market uptake. Reaching a sufficient scale fast to offer multiplay services over

Exhibit 1: Convergence of the Digital Home



state-of-the-art distribution platforms to as many subscribers as possible is the only feasible strategy in this fixed-cost-driven infrastructure business in which a large part of the total cost base basically remains the same irrespective of the number of customers. In view of the huge investments in infrastructure and content that are already being made by many market players and new market entrants, convergence to the Digital Home is an irreversible trend.

The potential consumer benefits of developing the Digital Home in Europe are significant. Consumers will have the choice between a number of state-of-the-art interactive distribution platforms, all equally equipped to act as a one-stop-shop for the provision of triple play services. Each distribution platform will deliver a multitude of the currently available free-to-air programming, containing a significant amount of European, national, and local content: Both entertainment, cultural and educational in nature. In recent years, digitalization has already led to a significant increase in new channel launches. Since 2003, more than 200 new channels have been launched per year in Europe (Exhibit 2). Together with the then-possible targeting of content to individual viewers, this development also promises the emergence of more niche content, fostering cultural diversity (e.g., minority content, special language content). This specialized content reflects the fragmentation of the audiences.

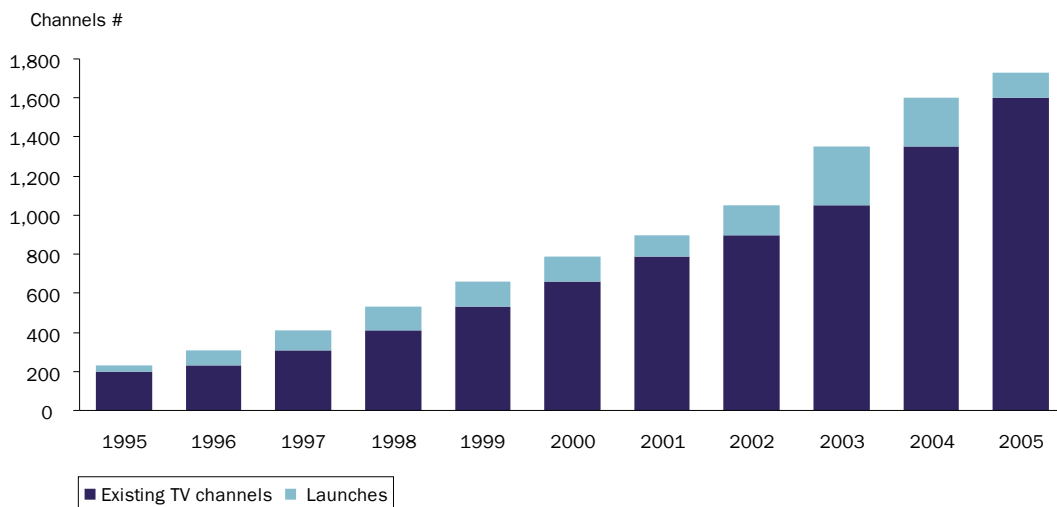
The development of the Digital Home brings significant benefits to the consumer

The range and diversity of premium content will also increase significantly. Viewers will be able to take more conscious decisions about what to watch. In order to cater for these fragmented customer preferences, investment in programming will rise.

At the same time, innovative services will become available with the introduction of greater interactivity over state-of-the-art networks. Advanced digital services are increasingly putting the control of media directly into the hands of consumers—allowing them to access what they want, when they want it (IPG, PVR, VoD). Furthermore, Digital Homes can expect having access to improved picture and sound quality for traditional broadcast entertainment offers with higher distribution quality becoming available, for example, HDTV as well as audio. Subscribers to digital services in the United States already have these choices today (Exhibit 3)—and make intensive use of them. Consumers will ultimately also control on which device they retrieve and enjoy the content of their choice in their home. Digital Homes will further gain access to interactive services beyond audiovisual services. Digital telephony services (VoIP) will become as common as a range of broadband internet access speed levels to choose from (symmetric or asymmetric), tailored to consumers' specific needs.

Finally, the Digital Home will enable greater participation in society. Every Digital Home will have interactive access to public interest content and services (e.g., local

Exhibit 2: Development of European TV Channels (1995-2005)



Source: Screen Digest

Exhibit 3: Digital TV Services in the United States (examples)



EPG
electronic on-screen
program guide



Mini-Guide
information
while watching



Digital Cinema premium movies and other
programs in HDTV (8-15 channels)



On-Demand pay and free packages



Dedicated Movie channels



Digital TV
with more than
150 channels

Foreign Language Packages
e.g., Latino, Chinese



Interactive Gateway

- Email
- Weather
- Games
- Entertainment with broadband internet access at 6 Mbps speed

Sources: comcast.com, Booz Allen analysis

government services, medical services, government and parliament channels) and the option to interact with public bodies/administrations as well as to proactively participate in a democratic society (by e-voting, for example). In Italy, consumers can already access local information via their TV set. Useful numbers and opening hours of government agencies are on display as well as all the employment offers of the local job center.

2. High Acceptance Expected: Consumers Want It, Once They See It

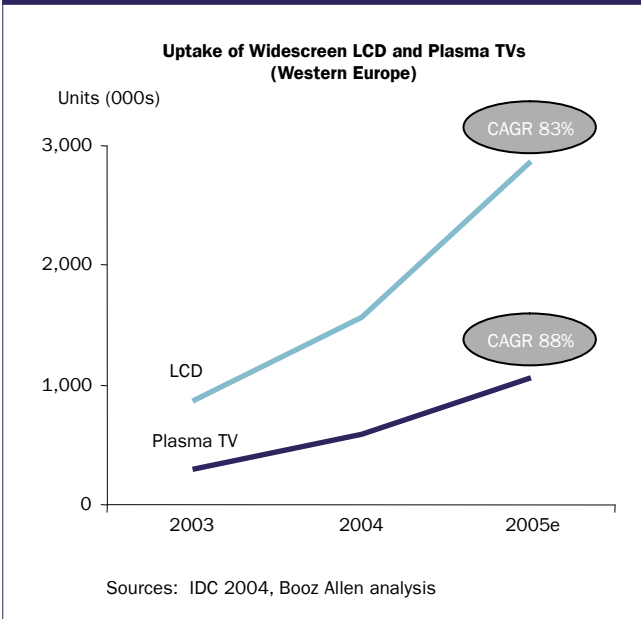
Despite some consumer inertia, spending trends indicate that European consumers are investing in new technologies that enhance their TV experience, such as widescreen liquid crystal display (LCD) and plasma TVs (Exhibit 4). Consumers' interest in and spending on digital services are stunning—once an attractive offering is available. In music, Apple managed to provide such an attractive consumer offering with its iPod and iTunes, changing the music industry almost overnight. Overall downloads exceed 500 million songs to date. Apple turned digital music downloads into a staggering commercial success. In the second quarter of 2005, Apple realized revenues of \$U.S.1.2 billion with the iPod—more than one-third

Consumers are ready to adapt to new equipment for interactive services or enhanced media consumption—and they are ready to pay for it

of Apple's total revenues. In October 2005, Apple announced the video iPod, which could shake up the (portable) digital video industry in a similar way. Consumers understand the benefits of digital services and have expressed their interest. Consumers, however, express significantly more interest in new digital services and features after they have had the opportunity to experience them (Exhibit 5). The industry needs to be aware of the passive nature of the consumer demand and proactively offer new digital services with low barriers for consumers and then actively market these services. A good example of the nature of the consumer is the reaction to "TiVo", the PVR service in the United States. Initially, the company found it difficult to persuade consumers of the value added of the service. After the company started to provide the service at no charge during the first test months, it found that the subscription was rarely cancelled. Now 93 percent of TiVo's customers find the service amazing, citing in particular the superior TiVo user interface that makes the product so easy to use.

High-definition television (HDTV) provides theater quality pictures and CD-quality sound to consumers—bringing cinema experience to the home. The 2006 soccer world championship in Germany, which will be broadcasted in HDTV, is expected to boost

Exhibit 4: EU Consumer Uptake of "Next Generation" TV Equipment



consumer interest in the service significantly. Japan and the US are currently leading the field in HDTV. At the end of 2004, HDTV was available to more than 90 percent of US households.

On-demand services will further drive adoption and usage of Digital TV. The benefits of VoD are easy to understand

for the consumer due to VoD's proximity to existing video/DVD rental services—just with more convenience. As such, VoD is thus regarded to be one of the first interactive services with real mass market appeal.

**Enhanced TV services:
Consumers want them . . . but
seeing is believing**

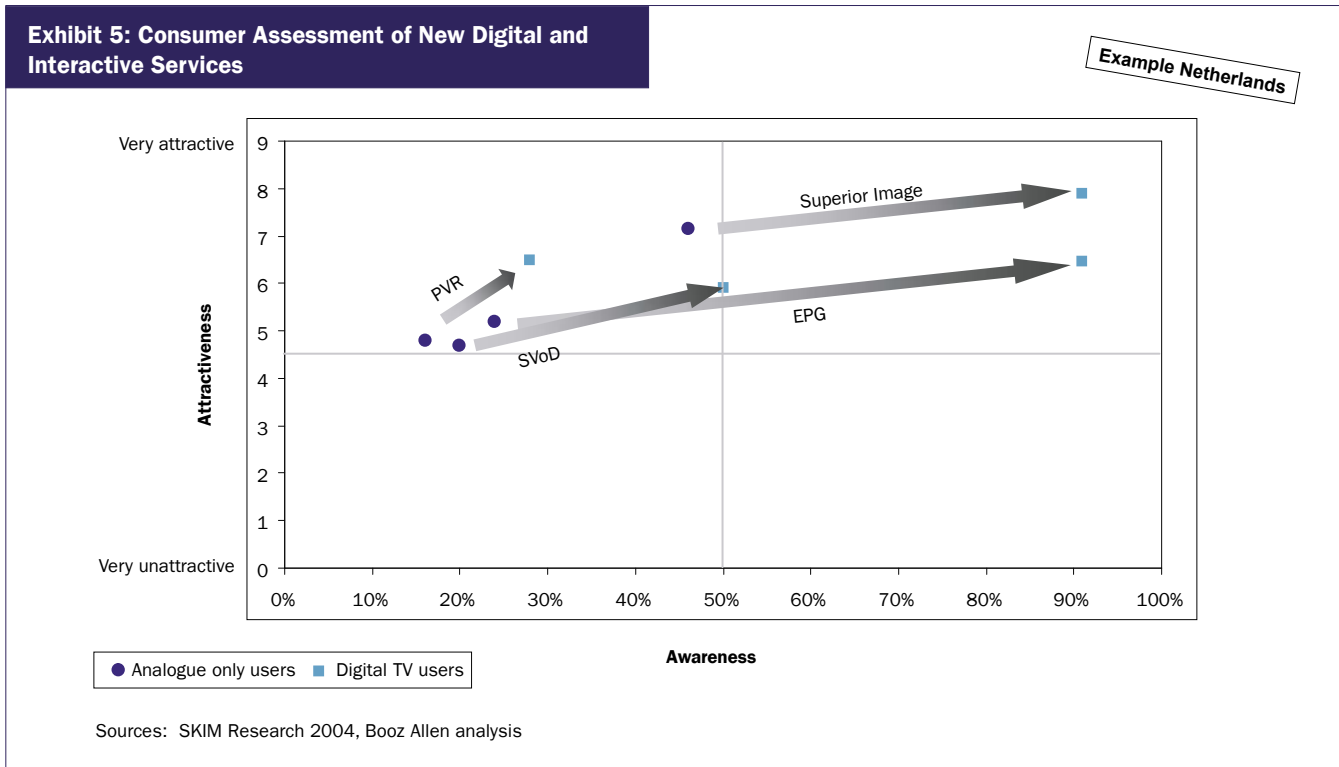
In the U.S., industry leader Comcast is offering an extensive library of both paid and free on-demand content. Of all Comcast VoD-enabled households, more than 65 percent are active users and new Comcast VoD customers typically place 23 orders per month.

3. A Cause for Action: Europe Is Lagging Behind the United States and Asia

Although Europe is clearly moving towards the Digital Home, an international market comparison shows that other regions are far ahead in terms of penetration rates and service availability.

Many European countries are now seriously lagging behind the United States in penetration rate of Digital TV (Exhibit 6). Europe's average penetration rate of roughly 20 percent in Digital TV compares poorly with that of the United States, where half of all households subscribe to Digital TV services. The U.S. market is not only larger but also growing more rapidly. As a result, there is strong growth in the United States in digital

Exhibit 5: Consumer Assessment of New Digital and Interactive Services



services and content development, whereas in Europe enhanced services such as electronic program guide (EPG), VoD, and PVR are only just being introduced in most markets.

In broadband service, Europe significantly lags behind Asia. With a roughly 24 percent average penetration rate, Europe overall is closely behind the United States, but lags far behind leading Asian countries such as Japan, Taiwan, Hong Kong, and most notably Korea (Exhibit 6).

Korea's government is leading by example to stimulate e-business. Early on, the government adopted an e-commerce-based public procurement service. In 2001 more than 80 percent of all procurements in the public sector were carried out online. The adoption of e-commerce has had a spillover effect on the business community because not only do businesses bid online for government contracts, but the government also uses B2B sites to procure goods and services.

Korea exemplifies the benefits of Digital Home technologies: broadband is a catalyst for education, innovation, economic growth, and job creation

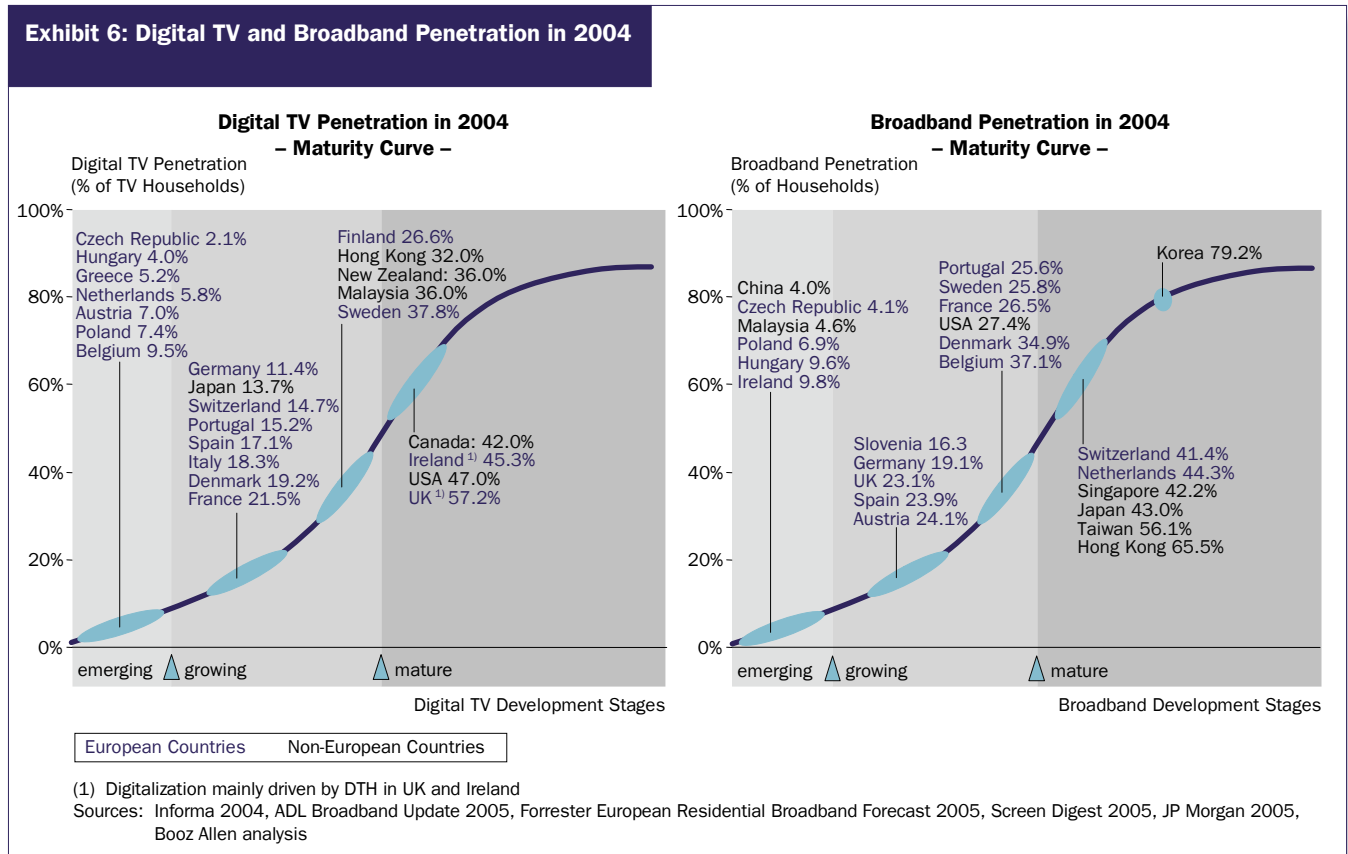
Europe lags behind the United States in Digital TV penetration and behind Asia in broadband services

With a household penetration rate of almost 80 percent, Korea offers a good example of how broadband can positively influence

society. Online shopping already makes up nearly 12 percent of all retail sales in the country. As Korea approaches its penetration ceiling, operators such as Korea Telecom respond and are now aiming to become a "broadband communication provider" and to serve customers with high-speed, high-quality broadband communication services such as file transfer, video services, and peer-to-peer communication.

These examples from an advanced broadband economy denote the importance of broadband as a catalyst for education, innovation, economic growth, and job creation. Flourishing around the broadband access providers is an entire ecosystem of companies that capitalize on the broadband infrastructure. This environment, in turn, results in economic growth, which generates new employment opportunities.

For Digital TV, high penetration rates and proliferation of new digital services are evident in more advanced markets such as the United States (Exhibit 7).



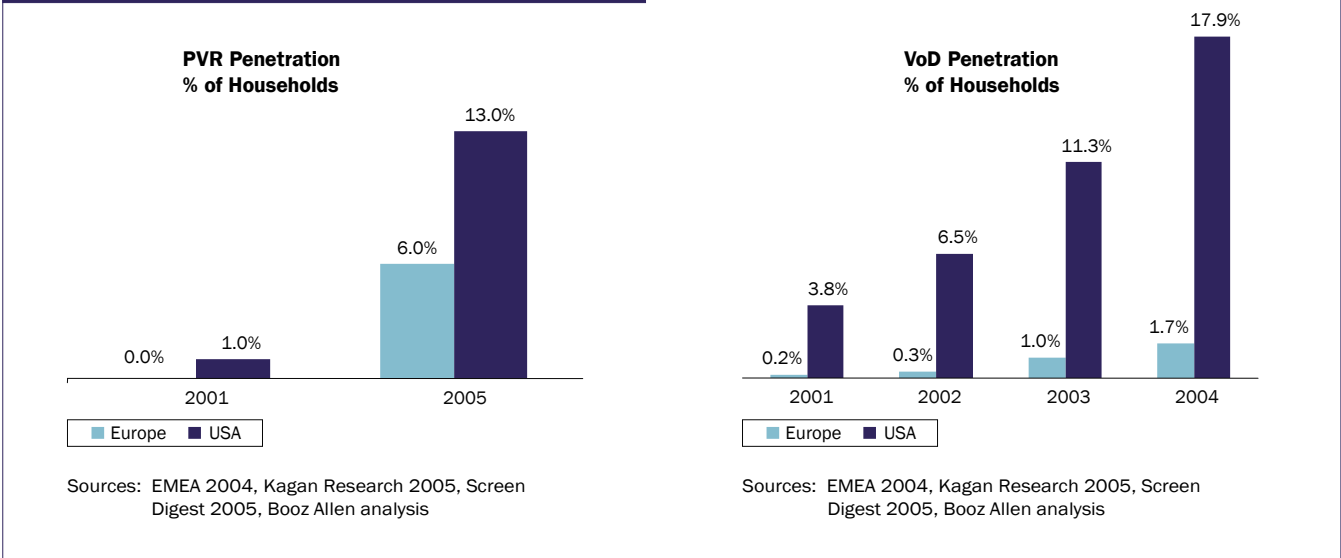
Initial Digital TV growth was driven by more channel variety and improved picture and sound quality, allowing consumers to benefit from their private investments in wide-screen TVs and enhanced home entertainment systems. The number of digital channels increased significantly, mainly as a result of the consolidation in the cable industry after 1996. The cable industry's investments have led to the creation of an increasing number of cable networks, that is, broadcasters affiliated with cable operators. According to National Cable and Telecommunications Association (NCTA) estimates and data from the U.S. Federal Communications Commission (FCC), the number of national cable networks providing content for cable operators has risen from 145 in 1996 to 390 by year-end 2004—a 269 percent increase during 8 years (Exhibit 8). Programming has become ever more diverse over the years. A significant number of program choices for ethnic and minority audiences have been added, such as “Black Family Channel”, “Black Starz!” or “Discovery en Espanol”. Also, local and regional content has proliferated during the past 19 years: 25 state public affairs networks and 30 regional cable networks

rather than on the PC. For example, Cablevision, a cable operator with a strong presence in New York, offers interactive services via its Interactive Optimum (iO) digital platform such as “Metro Weather Interactive” with localized forecasts; “Metro Traffic Interactive”, which includes live camera shots of congested road-ways; and the “iO Dashboard”, which lets users access news, sports, weather, and horoscope information.

The United States has proved the benefits and consumer acceptance of enhanced Digital TV services: More consumer choice, more consumer control, higher entertainment value, and industry growth—Digital TV becomes an important means for digital inclusion

The basis of competition is thus shifting from the number of channels to breadth and quality of advanced digital services, allowing for more participation and interactivity.

Exhibit 7: Uptake of PVR and VoD in the United States compared with Europe



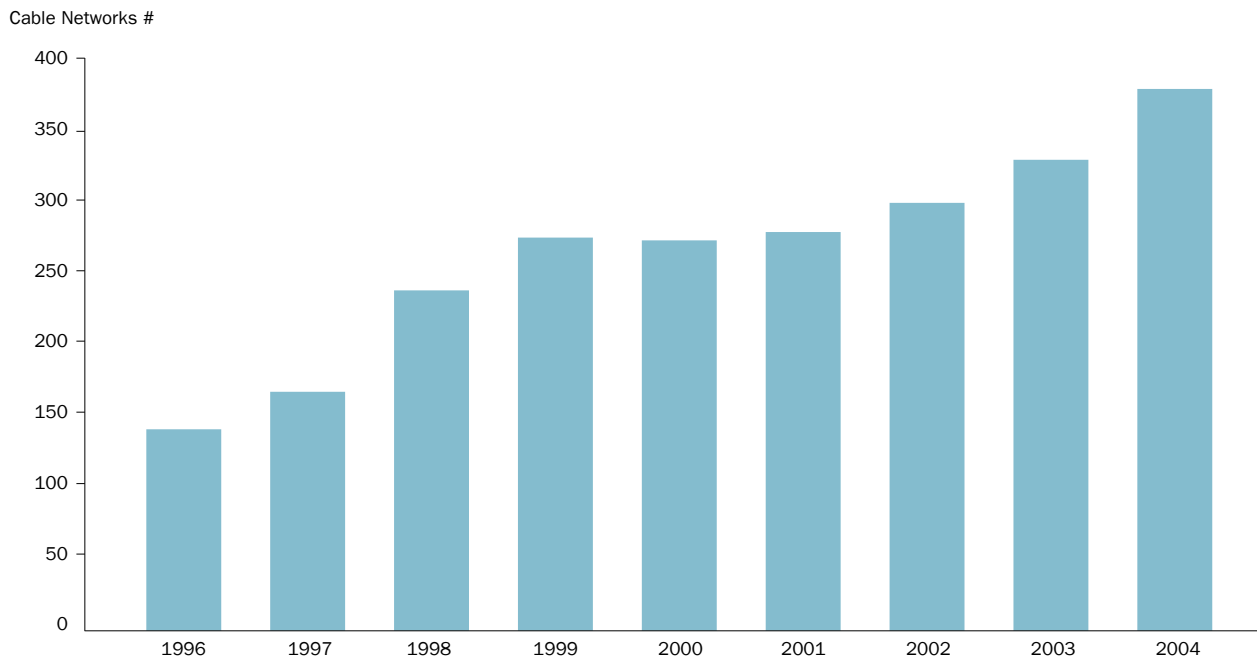
are now providing in-depth coverage of local, state, and regional news and public affairs.

The second wave of growth—following improved quality and more channels—is fuelled by the success of the PVR functionality and VoD services. Both technologies give consumers more control over what they want, when they want it. In addition, interactive services provide a more rewarding viewing experience for consumers, allowing them to actively participate (Exhibit 3). Other interactive services effectively help to drive digital inclusion because they are offered on the TV screen,

Leading Digital TV countries, such as the United Kingdom, have established a strong pay-TV culture, which enables the proliferation of new content. The analysis of the programming spending of major UK television channels during the early years of digitalization clearly highlights this trend with a doubling of the spending on original programming between 1998 and 2003 (Exhibit 9).

As a result, the United Kingdom has roughly four times as many pay TV channels than Germany, where digital

**Exhibit 8: Development of U.S. National Cable Networks¹⁾
TV Channels (1996–2004)**



(1) Cable networks are programming services that deliver packages of information or entertainment by satellite to local cable television systems. The cable systems then redistribute the network programs, through wires, to individual residences in their local franchise areas

Sources: FCC, NCTA

penetration rates are just slightly above 10 percent (Exhibit 10). As illustrated in Exhibit 10 the number of dedicated pay-TV channels is closely linked to the Digital TV penetration level of a country, creating a virtuous cycle: Attractive pay-TV content attracts viewers and drives digital penetration, while a high digital

penetration increases the financial attractiveness for content providers to develop more channels. Freeview customers can upgrade to Sky to receive an even wider choice of TV channels. The company has also introduced Sky+, a PVR that allows customers to record TV shows digitally on its built-in hard disk. Partly as a result of these strategies, 57 percent of British households have Digital TV (Exhibit 6).

Pockets of excellence in Europe show that European consumers adopt new interactive PC and TV services quickly—if the value proposition is attractive and well communicated

penetration increases the financial attractiveness for content providers to develop more channels.

The success of BSkyB builds on three key factors that provide lessons for all players migrating to digital services. First, BSkyB has strongly emphasized high-quality content from the start. BSkyB provides a wide variety of high-quality channels, including channels with premium content (e.g., particularly around sports and movies). Particularly in light of the limited programming choice of free-to-air channels in the United Kingdom, BSkyB was able to establish a highly attractive and differentiated offer for consumers. In European countries with many free-to-air analogue channels, operators typically find it more difficult to position the digital offer as distinctive and high value against the current analogue offer. But as seen in the United States, a high number of analogue channels does not necessarily prevent Digital TV from becoming a mass market success. Second, BSkyB established an attractive pay business model. Basic digital subscribers receive

The high rates of Digital TV penetration in the United Kingdom and Ireland are driven primarily by the success of satellite-based BSkyB, which has become Britain's largest Digital TV platform with 7.3 million subscribers. BSkyB owns and operates 22 channels focusing on premium entertainment (e.g., Sky Movies) and sports (Sky Sports). To boost further growth, the company has launched Freeview, a joint venture with the British Broadcasting Corporation (BBC), providing customers with access to digital channels without requiring a monthly subscription. The incentive is that

only a basic bouquet but have the possibility to upgrade their package “à la carte”—fitting their needs and spending ability. Of equal importance is the attractiveness of BSKyB’s model to other content providers. When using BSKyB’s satellite-based platform, content providers receive a fair share of the revenue and are awarded with long-term contracts and thus stability. Third, BSKyB has demonstrated the importance of excellent sales and marketing skills. BSKyB was able to establish a strong, high-quality brand in line with the premium content offerings.

To sum up the infrastructure discussion, it is important for industry and regulators to not focus exclusively on broadband as the only digital infrastructure in place. Consumers’ needs for entertainment, information, and interactive services can be met by both broadband and Digital TV. In fact, in more advanced countries such as the United Kingdom, Digital TV has already outgrown broadband in terms of penetration and is expected to continue to bring digital services to the majority of the population.

Exhibit 9: Original Programming Development Driven by Digitalization (£ million, example UK)

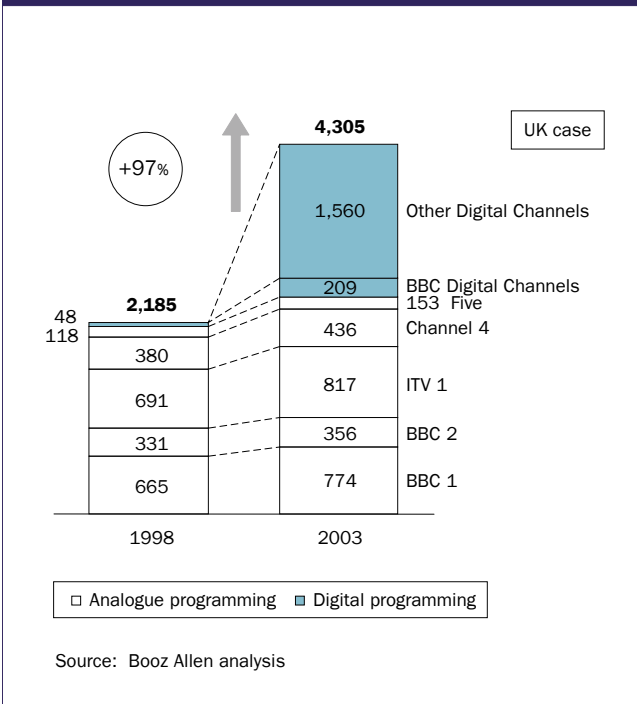
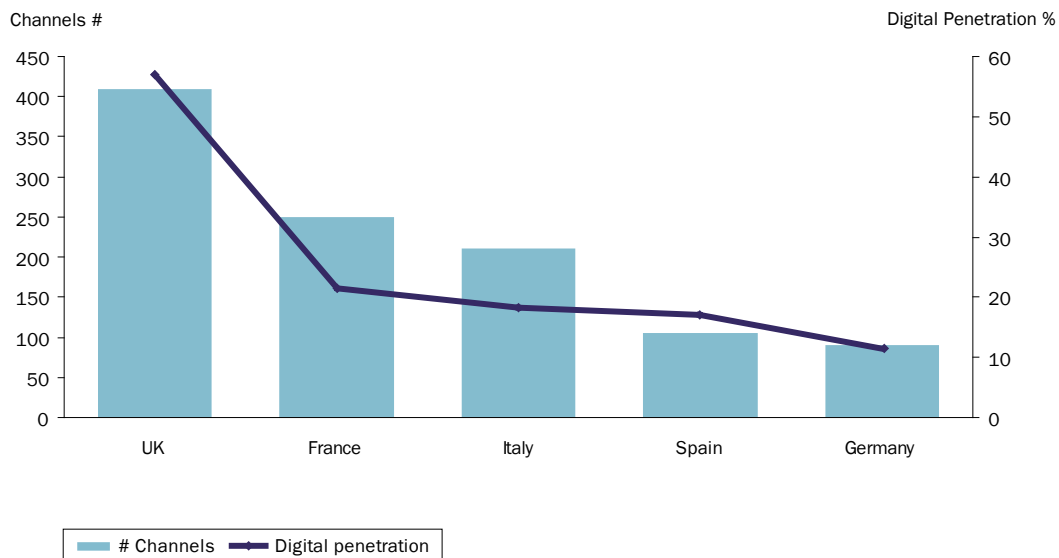


Exhibit 10: Dedicated Pay TV Channels versus Digital Penetration (selected European countries)



III. EVOLVING COMPETITIVE LANDSCAPE FOR THE DIGITAL HOME MARKET

1. Industry Convergence Has Become a Business Reality

In many European countries, cable operators have left their traditional TV market and expanded their service offering first with broadband internet access and then with telephony. For cable operators, this move into broadband and telephony has been a way to grow their businesses—offering additional services to their customers.

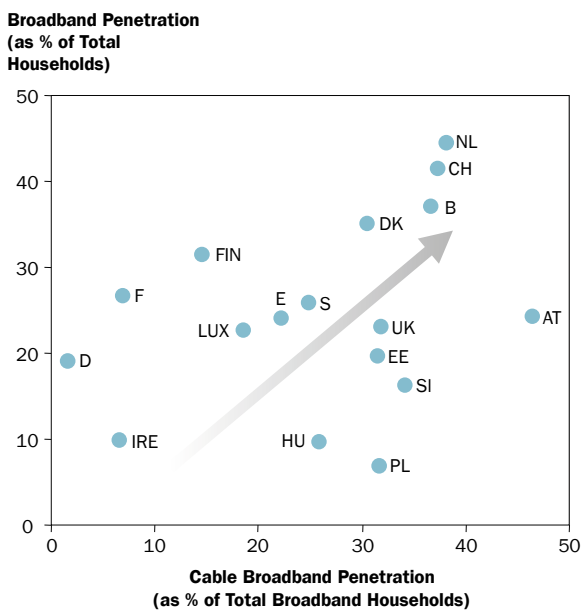
In markets with strong infrastructure competition, cable operators were particularly successful in driving

Many cable operators have successfully rolled out broadband and telephony services across Europe—balanced infrastructure competition has driven innovation and service uptake

broadband penetration (Exhibit 11). As a result countries with a high share of cable broadband access show overall high broadband penetration rates on a national level. Cable affine countries, such as the Netherlands, Belgium, or Switzerland, are clearly leading in broadband penetration in Europe, with penetration rates beyond 37 percent.

Cable affine countries, such as the Netherlands, Belgium, or Switzerland, are clearly leading in broadband penetration in Europe, with penetration rates beyond 37 percent.

Exhibit 11: Broadband and Cable Broadband Penetration (Europe, 2004)



Sources: Screen Digest 2005, Booz Allen analysis

In contrast, the focus on service-based broadband competition (e.g., unbundling of local loop) in Germany or France has led to average penetration rates of only 19 percent and 27 percent, respectively.

Cable operators' role in driving penetration becomes even more apparent when comparing access speeds and average prices (Exhibit 12). Cable operators typically offer a more attractive offer to consumers: Faster broadband access at lower prices compared with telecommunications incumbents. As illustrated in Exhibit 12, cable operators offer more than twice the access speed as well as significant price discounts compared with telecommunication incumbents in countries with a strong cable presence.

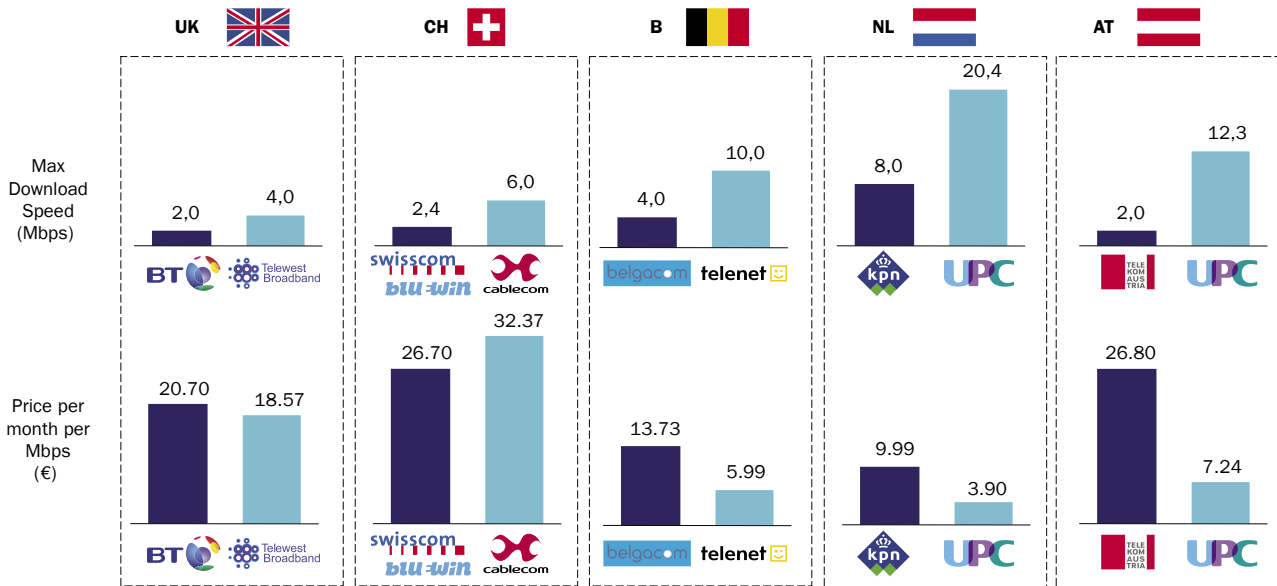
Telecommunications incumbents are catching up fast, investing in network upgrades and aggressively entering the Digital TV world with their TV over DSL services (Exhibit 13). An example is France Telecom with its "MaLigne" TV over DSL offering. France Telecom recently invested € 50 million in a 3-year wireline exclusive soccer deal with Canal+ (Exhibit 26). Telecommunications operators also invest in network upgrades, such as Belgacom's € 300 million investment in planned upgrades to very high speed digital subscriber line (VDSL) by 2007.

Telecommunication incumbents are reacting and adding TV and video services to their portfolios

For telecommunication incumbents, the move into TV and video has been predominantly a defensive move to protect their fixed line customer base (Exhibit 14). In recent years, their fixed line customer base came under attack with attractive alternative offers not only from cable operators, but also from unbundled local loop carriers and mobile operators. Because the TV distribution market with ~21 bn € is relatively small compared with the fixed telephony market of ~90 bn € in Europe, telecommunications incumbents cannot expect a major revenue boost from entering the TV market.

For example, France Telecom launched its "MaLigne TV" offer in December 2003 to react to the loss of broadband market shares and falling wholesale prices. The customer base grew quickly to 100,000 subscribers in the first quarter of 2005. Rapid geographic expansion to big French cities gives the TV service a current potential reach of 8.5 million households (33 percent), which is expected to increase to 10 million households by the end of the year. At the same time, alternative tele-

Exhibit 12: Comparison of Broadband Offerings—Cable versus Telco (Flat Rates for Unlimited Access, Sept. '05)



Sources: Company information, Booz Allen analysis

communication providers are expanding their service portfolios. Fastweb, Italy's second largest fixed network

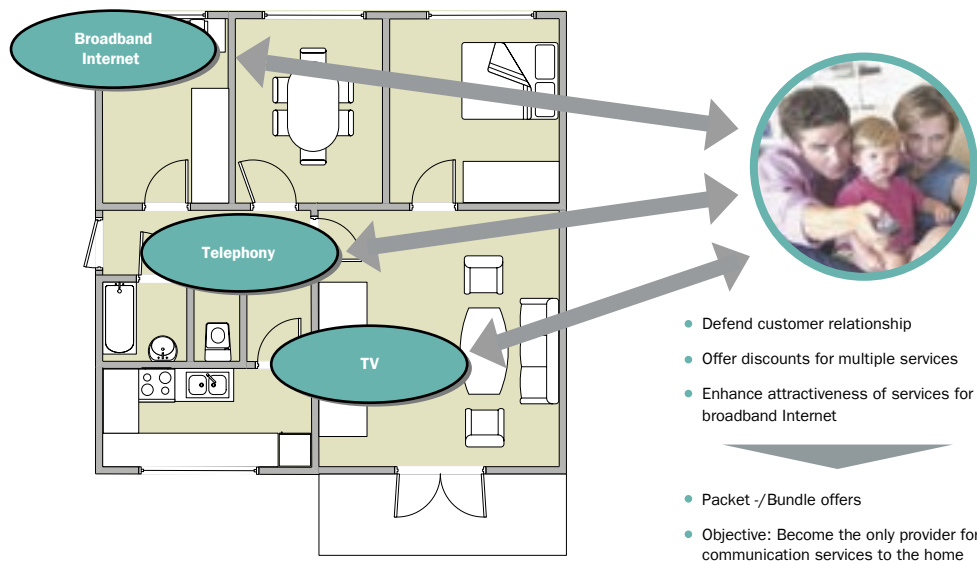
operator, pioneered the TV offering via a broadband connection, launching VoD offerings as early as 2001 and

Exhibit 13: TV Offers of Telecommunication Incumbents (examples)

Operator	Prices and packages	Comments
	<ul style="list-style-type: none"> • Maligne TV basic package @ € 16 (includes a range of VoD movies and special TV shows) • "TPS Panoramic" @ € 35 (exclusive soccer coverage, movie channels, music programs, all French and many international channels) 	<ul style="list-style-type: none"> • Commercial launch of TVoDSL services end of 2003, significant rollout • Extensive VoD library (à-la-carte model)
	<ul style="list-style-type: none"> • BTiPlayer plus Freeview @ € 126 • Sky+ box plus Sky TV @ € 125 (including Sky+ channel package, PVR, pause live TV and instant rewind) 	<ul style="list-style-type: none"> • Offer includes EPG and interactivity features such as answering machine, SMS and e-mail on TV • Sky offer includes PVR
	<ul style="list-style-type: none"> • TV and VoD over ADSL: <ul style="list-style-type: none"> - "Classic+" Package @ € 9,95 per month - Football package @ € 15-25 per month - Football PPV (Saturday night games) @ € 8/game - VoD from € 2-6 per view and 24 hours 	<ul style="list-style-type: none"> • Offer includes PVR • Interactive services include voting, e-commerce, information services, email and SMS on TV
	<ul style="list-style-type: none"> • Currently offer a VoD offering • Movies @ € 0.95-€ 4.95 per film and view 	<ul style="list-style-type: none"> • Enables VoD, additional TV programs, web mail services • Coming in 4Q05: EPG, triple play, interactivity (emails on TV, Information on TV)

Sources: Company websites, Communications Week International, Booz Allen analysis

Exhibit 14: Triple Play Motivation for Telco Operators



Source: Booz Allen analysis

full TV over DSL in the summer of 2003. Vital for Fastweb's success is a strong entertainment content strategy (broadcast TV, Pay TV, VOD), which drives the take-up of core telecommunications products (VoIP, broadband internet access). Fastweb now successfully offers an extensive triple play entertainment suite via its fibre network to differentiate its offer from Telecom Italia: in 2004, 35 percent of all residential customers subscribed to the bundle "Tutto Senza Limiti", which offers unlimited phone calls and internet, and 10 percent of new customers selected the premium bundle "Fastweb Total".

Low PC penetration (~50 percent in Italy) has not represented a barrier to growth: appealing TV content was vital to attract non-PC users also. As such, roughly 20 percent of Fastweb's customers do not own a PC.

Similarly, Iliad's "Free" in France, offers a complete triple play suite at currently € 29.99/month. At the end of the second quarter 2005, Free had 1.3 m ADSL subscribers, 1.1 m phone users, 1 m triple play subscribers with basic TV offer (80 channels), and 130,000 pay TV subscribers (up to 260 TV channels). With these operating figures Iliad is the # 1 TV over DSL provider and # 1 telephone over DSL provider in Europe.

2. The Rules Are Changing: Emerging Patterns of the New Competitive Landscape

Broadband internet access has been the first battleground in this new convergent space (Exhibit 15). In broadband, cable operators and telecommunications companies compete for share by continually improving access speeds—to the benefit of the consumer. Voice telephony was next, and the emerging battleground is the TV/video market.

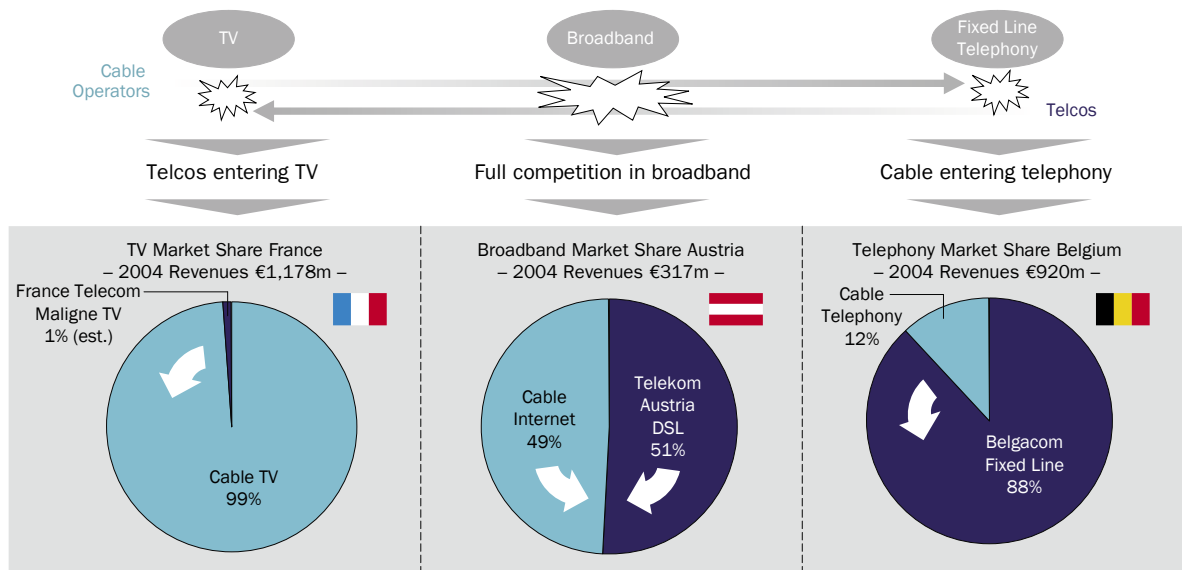
Several infrastructure providers are competing in the future TV distribution market. The shift from analogue to Digital TV will accelerate these changes in the TV market structure because Digital TV services require a digital set-top box (STB)—at this stage, the consumer will make a buying decision, which offers entry opportunities for competitors. Different types of new providers are taking advantage of the analogue to digital conversion to enter the TV distribution market (Exhibit 16). Future competition in the convergent landscape will focus largely on triple play or multiplay offers. Consumers will have the choice between a number of state-of-the-art distribution platforms, which

act as a one-stop-shop for the provision of triple play services. Success stories from advanced markets are

Alternative telecommunications providers increasingly use triple play offerings to differentiate versus the competition

After broadband and telephony, TV distribution is the next market that is challenged by new competitors

Exhibit 15: Competition in the Convergence Space (selected European markets)



Note: Total revenues do not represent the total market size but only the revenues of the incumbent and the cable industry
Sources: Screen Digest, Company websites, Booz Allen analysis

already apparent, including, for example, the Telewest offering in the United Kingdom or the SBC/Bell South/Cingular bundle in the United States (Exhibit 17). Multi-play bundles play a central role in the commercial service offering of Telewest. Of its current customers, 30 percent subscribe to a triple play bundle; but of all new

customers Telewest acquires, 80 percent subscribe to more than one service. A similar story holds true for NTL in the United Kingdom, with 25 percent of subscribers being triple play customers, and more than 70 percent of all subscribers using more than one service. However, not all platforms have the same technical potential

Exhibit 16: Different Providers in the TV Distribution Market

	Player Type	Strategic Thrust	Platform	Initial Success	Examples
Incumbents	CATV	<ul style="list-style-type: none"> Defend/expand core business Enter triple play market 	Digital Cable	<ul style="list-style-type: none"> Good consumer acceptance, when done properly 	Comcast, US
	DTH	<ul style="list-style-type: none"> Defend/expand core business 	Digital Satellite (DTH)	<ul style="list-style-type: none"> Good success for free TV and pay TV services in Europe 	Astra, pan - Europe Sky, UK
New Entrants	Telco Incumbents	<ul style="list-style-type: none"> Defend core business (telephony/Internet) Enter triple play market 	TVoDSL	<ul style="list-style-type: none"> First successful trials Possibility to expand to mobile distribution 	France Télécom, F Telefónica, ES
	New Telco Players	<ul style="list-style-type: none"> Enter triple play market 	<ul style="list-style-type: none"> TVoDSL Fibre to the Home (FTTH) 	<ul style="list-style-type: none"> Significant subscriber ramp-up within franchise 	Fastweb, IT Free, F
	DTT Providers	<ul style="list-style-type: none"> Develop new business in digital TV 	DTT	<ul style="list-style-type: none"> Varying success - good traction mainly in free-to-air market 	Freeview, UK Digitenne, NL

Source: Booz Allen analysis

Exhibit 17: Triple Play and Bundle Success Stories (examples)

Bundle Success Example (US)

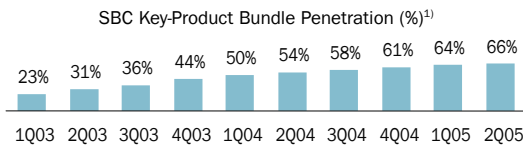


Approach

- **Comprehensive bundling strategy**
- Integration/**alignment of wireline/wireless** activities
- **Partnerships** with Yahoo (DSL) and EchoStar (Sat. TV)
- **Bundled services:** telephony, call mgmt services, wireless services, satellite TV, DSL – à-la-carte approach
- **Integrated products:** Single wireline-wireless mailbox, device-based forwarding, multi-access to data

Impact

- **Strong bundle adoption**
Key-product bundle penetration¹⁾ 2Q05 at 66%
Strong bundle sales with wireless component
- **Increased revenue:** Customers buy more services
- **Churn reduction:** Customers with three key-products are 40% less likely to churn than customers with only two key-products



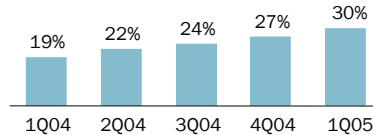
(1) Percentage of customers with a retail access line plus at least one key service (long distance, DSL, jointly billed Cingular wireless, SBC/Dish network satellite TV)

Sources: Company Information, Booz Allen analysis

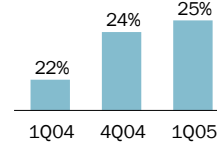
Triple Play Success Examples (UK)



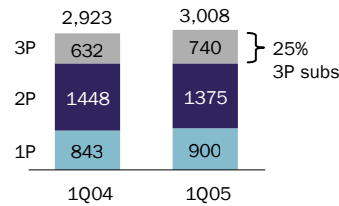
Triple Play Pick-up - %, 1Q04-1Q05



Triple Play Customers (on-net) - %, 1Q04-1Q05



Customer split (on-net) - '000'; 1Q04-1Q05



to offer triple play. Digital terrestrial television (DTT) has achieved a substantial geographic coverage. But the platform also shows major disadvantages: it has a lower video capacity compared with other technologies and no capabilities to deliver telephony or broadband. Similar constraints are true for digital satellite transmission

(DTH), which also lacks the full triple play capacity with only limited broadband and telephony possibilities. Furthermore, a significant upgrade

The early digitalization success of DTH triggered a competitive reaction from the other platform providers. DSL has been faster to bring broadband into European homes owing to lower capital costs per household than cable and the resulting efficient short-term returns. But in entering the Digital TV market, this platform still faces the challenge of significant upgrades to achieve sufficient capacity for enhanced digital services. The cable technology currently is the benchmark in video differentiation capacity. In addition to PVR, VoD, EPG, and the like, cable offers an integrated triple play capacity and very high bandwidth for video and data. Although network upgrades are necessary in the medium term, cable offers superior technical capabilities as a distribution platform. To compete successfully in the triple play market

environment, the economic size and strength of the players will be increasingly important. Developing the Digital Home requires large upfront investments that

The competition will be increasingly based on multiproduct bundles (TV, internet, telephony) that cover all household needs—triple play success stories are becoming a reality across the globe

of existing satellites is necessary in the medium term to offer limited broadband capabilities and more bandwidth—with all the risks associated with deployment of the satellite and with spacecraft technology. On the other hand, the satellite-based television providers are very fast to market, enjoy low maintenance costs, and have been innovative in developing differentiating video features like PVRs or near-VoD.

“TV only” distribution platforms will be disadvantaged, because they are not capable of delivering triple play services

are not scalable with the customer base, that is, they need to be undertaken long before the customer subscribes to the service. Key fixed costs include network

Scale will be increasingly important in the convergent competitive landscape to sustain the necessary upfront investments and to offer full triple play services

upgrades, development of new digital content, and upfront marketing expenses to migrate consumers to the digital platform (Exhibit 18).

Players need significant financial strength to shoulder the described large upfront investments and deal with the risks involved. Operators with large, stable cash flows and open access to capital markets have an advantage. A large subscriber base is also key to recoup large upfront investments because the average costs per subscriber will be lower. In addition, larger players can use their existing customer bases as a launch pad for new services. Critical mass is required to market successfully to mass market audiences, for example, via national TV campaigns.

Telco incumbents will be in a good position to dominate the Digital Home market

Although cable and telecommunication operators will both be driving the migration to the Digital Home, they do not compete on an equal footing. In the convergent industry, in which triple play bundles are the basis for competition, operators compete using their full financial strength from the combined telephony, broadband, and TV businesses (Exhibit 19). The big national telecommunication incumbents have an advantaged starting position in this new industry. In many countries, including cable affine countries such as the Netherlands and Belgium, the telecommunications incumbent is more than seven times the size of the total combined cable industry (Exhibit 19). The situation is aggravated because the cable industry is fragmented into regional cable franchises, which are competing against a telecommunications incumbent with national presence. Comparing for example,

telecommunications incumbent KPN with the largest Dutch cable operator, UPC, the ratio is 14:1.

Telecommunication incumbents still generate huge cash flows with their fixed and mobile telephony services, which they are willing to spend to enter the Digital Home market. This imbalance, as shown in Exhibit 19, could prove to be problematic to the development of the Digital Home. Thus a more holistic view on the convergence space is crucial.

Before an innovative EPG or VoD offering can be developed and brought to the consumer, the necessary two-way capable infrastructure has to be in place. DTH

satellite and DTT lack the return channel and point-to-point capability required for advanced digital value-added services (e. g., VoD, interactive services). Hence, the prime platform providers that will

drive digitalization in the convergence space are telecommunications and cable operators: Only they can offer

In many markets, cable operators will be the only credible contender to challenge telecommunication incumbents in the Digital Home Market

integrated triple play packages with broadband internet, Digital TV services, and fixed telephony. The two providers will have to develop the business models for the industry;

it is their task to make convergence work across the entire value chain and to devise win-win solutions for all parties. These platform providers also show the highest

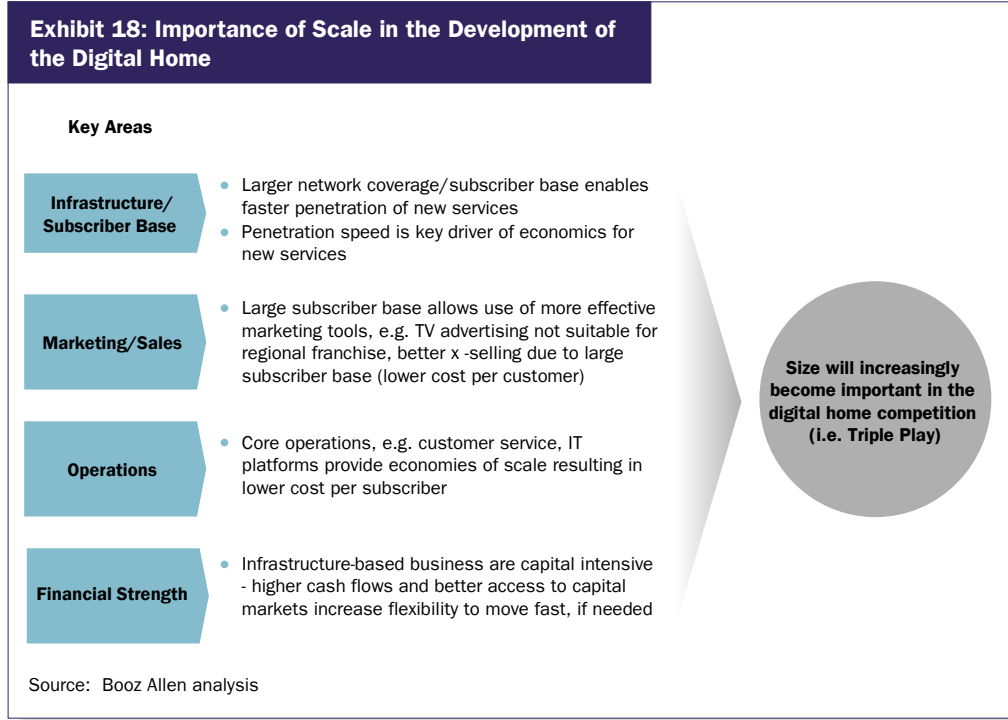
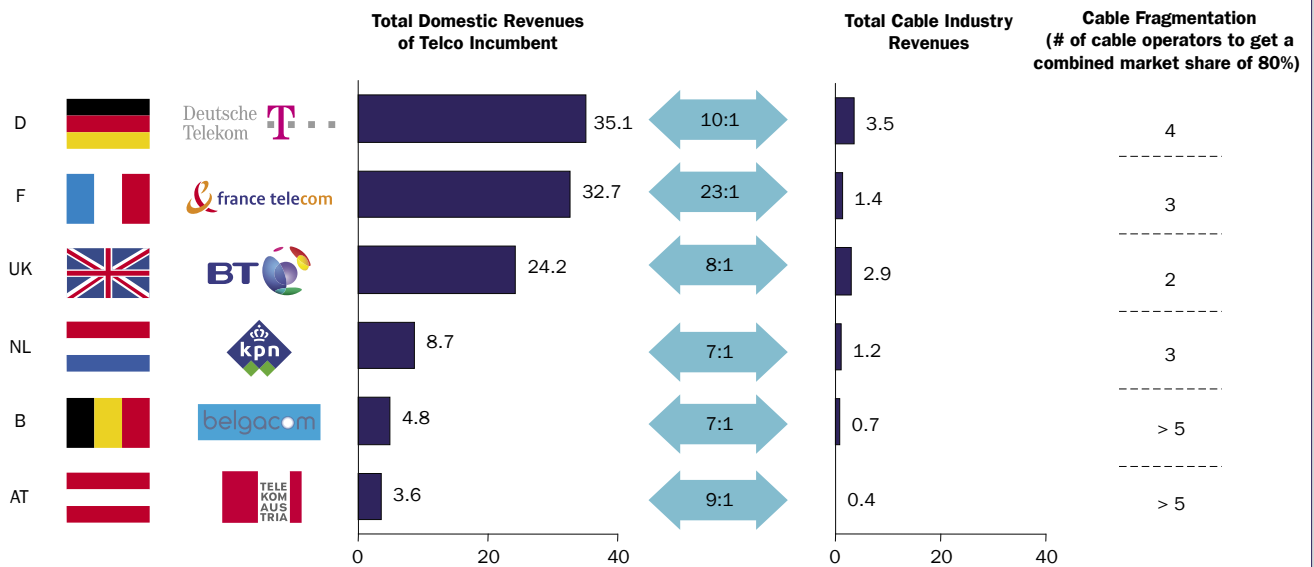
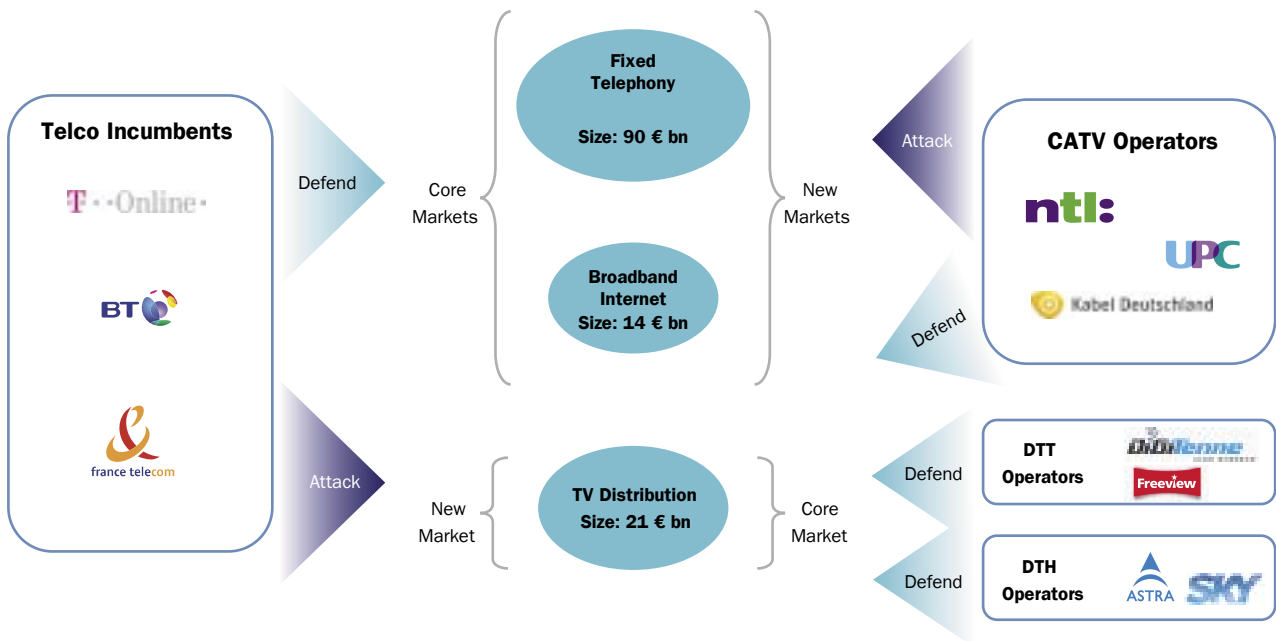


Exhibit 19: Revenues of Telecommunications Incumbents versus Cable Industry (€ billion, 2004)



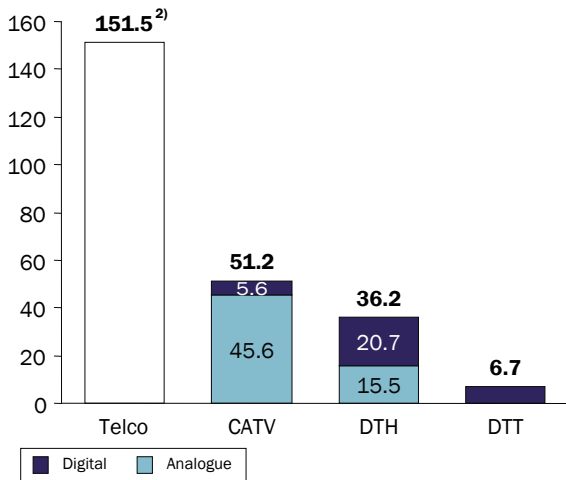
Note: Revenue includes fixed telephony, mobile telephony, internet access and TV distribution
 Sources: ABN Amro 2004, Screen Digest 2005, Company Information, Booz Allen analysis

Exhibit 20: Converging Markets in Europe¹⁾



(1) Includes: Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, and UK
 Sources: EITO 2005, Booz Allen analysis

Exhibit 21: Platform Subscribers in Europe⁽¹⁾ (million Subscribers, 2004)



(1) UK, France, Germany, Netherlands, Austria, Denmark, Finland, Sweden, Italy, Portugal, Spain, Switzerland, and Belgium
 (2) Number for telco include only the incumbents' subscriber numbers
 Sources: Screen Digest 2005, ABN Amro 2004, Informa 2004, Booz Allen analysis

infrastructure investment ratios: capital expenditures of revenues of about 20 percent. Eventually, cable and telecommunication players will compete head-to-head in all three markets—broadband, telephony, and TV—if cable can achieve the necessary scale to counterbalance the market power of the telecommunications platform (Exhibit 20). Both players strive to defend their current share while developing new revenue sources outside their respective core markets. DTH will remain a

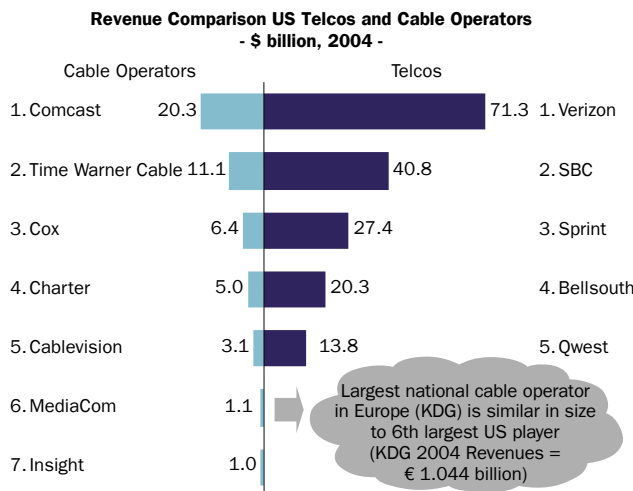
strong platform for basic digital and premium digital services owing to the integrative nature of the satellite-based providers. But DTT will most likely be a niche player in most countries (Exhibit 21). Both DTH and DTT players will compete only in the TV distribution market (Exhibit 20).

Industry consolidation would improve the competitiveness of cable operators vs. the telco incumbents and spur market development

In contrast to European countries, the United States shows the benefits of a more homogeneous and balanced industry landscape, in which cable operators were allowed to build scale in the competition with telecommunications players (Exhibit 22). In contrast to the situation in most of Europe, the U.S. cable industry has undergone a major consolidation during the past 10 years, triggered mainly by the deregulation after 1996. This consolidation enabled large, continuously increasing investments in content and the development of new digital services (Exhibit 23). U.S. cable operators' investments in programming have risen continuously from U.S. \$3.8 bn (1992) to almost U.S.

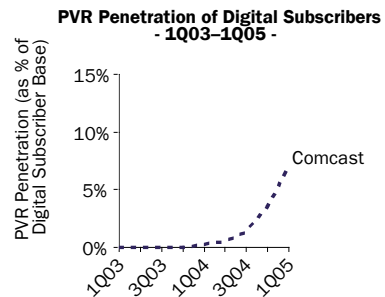
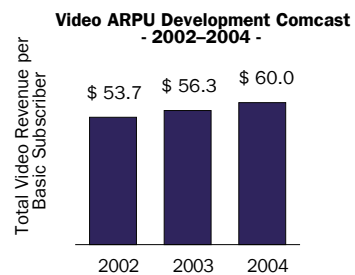
The digitalization of TV requires new "win-win" business models and partnerships across the value chain that allow different players to recoup high upfront investments

Exhibit 22: Competitive Landscape in the United States

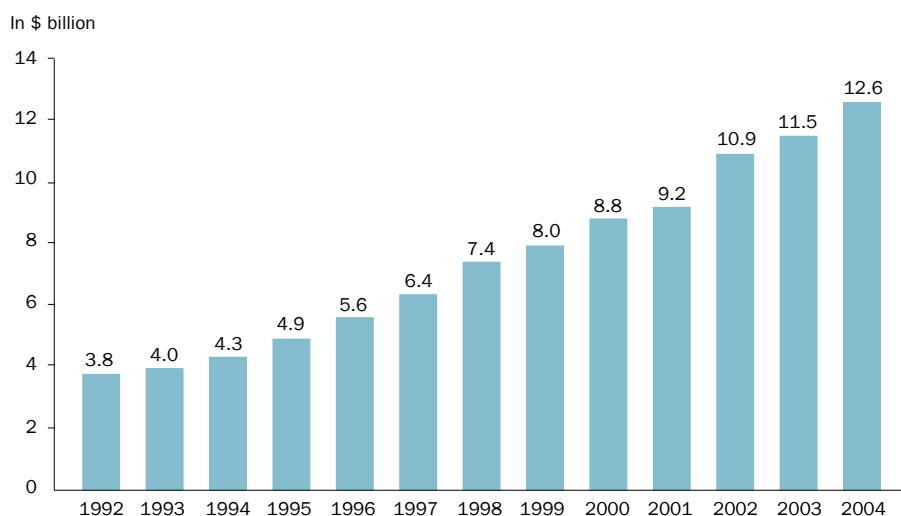


Note: Players do not necessarily compete in the same geographic region
 Sources: Vintage Research, A.G. Edwards, Annual Reports, Booz Allen analysis

Largest national cable operator in Europe (KDG) is similar in size to 6th largest US player (KDG 2004 Revenues = € 1.044 billion)



**Exhibit 23: U.S. Cable Programming Investments
(\$ billion, 1992-2004)**



Note: Programming expenditures include license fees, copyright fees and investments in local programming
Sources: NCTA estimates based on data from Kagan Research, LLC, and the U.S. Copyright Office

\$12.7 bn (2004), resulting in more choice and higher-quality programming for consumers. For example, the scale of Comcast has been instrumental in driving new digital services and content, including an extensive, free, on-demand offering, which gives opportunities for consumers to become acquainted with future-oriented services.

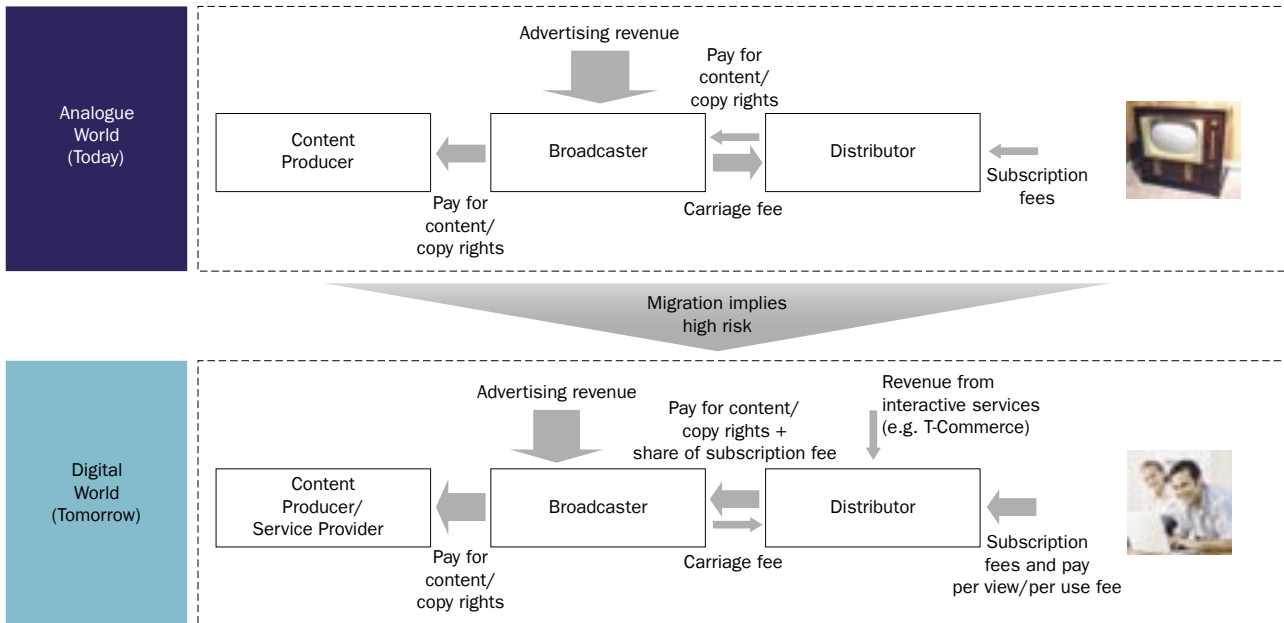
Compared to U.S. cable operators, European cable players are significantly smaller in size. The largest U.S. cable player, Comcast, has more than 20 times the revenues of Kabel Deutschland (KDG), the largest national cable player in Europe.

The opportunity is significant, but requires strong entrepreneurship. Many different players need to invest against one opportunity. Hardware and software manufacturers need to develop low-cost STBs and infrastructure. Distributors need to invest in new infrastructure and build up/migration of their customer base. Content providers must develop new digital interactive content that may initially have limited viewership. As a consequence, all parties must share the upside provided by the increase in overall revenues. Digital Home services are complex to deliver and typically require different players to interact across the value chain: network operators, broadcasters, content producers as well as service providers. Therefore, a key challenge for all players in the new convergent digital world is thus to develop new business models and partnerships. Exhibit 24 depicts a small part of the revenue stream between distributors and content providers to illustrate this challenge. Today, broadcasters rely on the proven business model of the analogue world, strongly based on adver-

tising revenues for delivering the content to as many viewers as possible. The switch to digital operations presents financial challenges for both distributors and broadcasters. For distributors, the switch to digital requires large upfront (fixed-cost) investments that are not easy to recoup. Thus, they will try to develop new and attractive services on a per-view or per-use basis. Content producers and broadcasters, on the other hand, face loss of a part of the advertising revenues in the more personalized Digital TV environment in which

the number of viewers becomes less important than having the right viewers. In tomorrow's digital world, this potential loss will be more than counterbalanced by higher earnings from subscription fees as well as lower carriage fees. To develop these new business models will be a key challenge, but it can be overcome, as more advanced markets have shown. Particularly, smaller to mid-sized broadcasters will have the opportunity to participate from the increasing revenue streams, for example by enlarging their channel suite. Smaller broadcasters, which were challenged by distribution capacity bottlenecks in the analogue world, will find it easier to get access to the consumer, now being able to freely choose between alternative distribution platforms. A good example for a successful business model is the partnership between BSkyB and Eurosport, in which Sky delivers the premium sports content and Eurosport the non-premium sports content. On the basis of a long-term strategic partnership and fair revenue sharing model with BSkyB, Eurosport was able to develop a new digital channel, called Eurosport 2, which has a stronger focus on live events and sports news. All parties in the value chain must agree on, and commit to the overall growth opportunity that the digital world offers. Growth will come from more targeted and interactive advertising, higher subscription revenues for improved services and content, and new revenue streams from interactive services, such as targeted information, shopping, and gaming. In Italy, for example, broadcaster Mediaset already offers premium content on a pay-per-view basis via the conditional access module in the STB. A special and anonymous prepaid

Exhibit 24: Changing Business Models in the Digital World



Source: Booz Allen analysis

card can be purchased at any shop, and it can then be used for any single event or special package that the customer decides to watch. The card can be reloaded several times and has to be substituted after its expiry date—the revenue is shared between all the different parties involved. The success of this “low cost” interactive offering is stunning: 4 months after its launch, 1.2 million prepaid smartcards have been sold.

3. Premium Content Is Key for Success: Competition Will Further Intensify

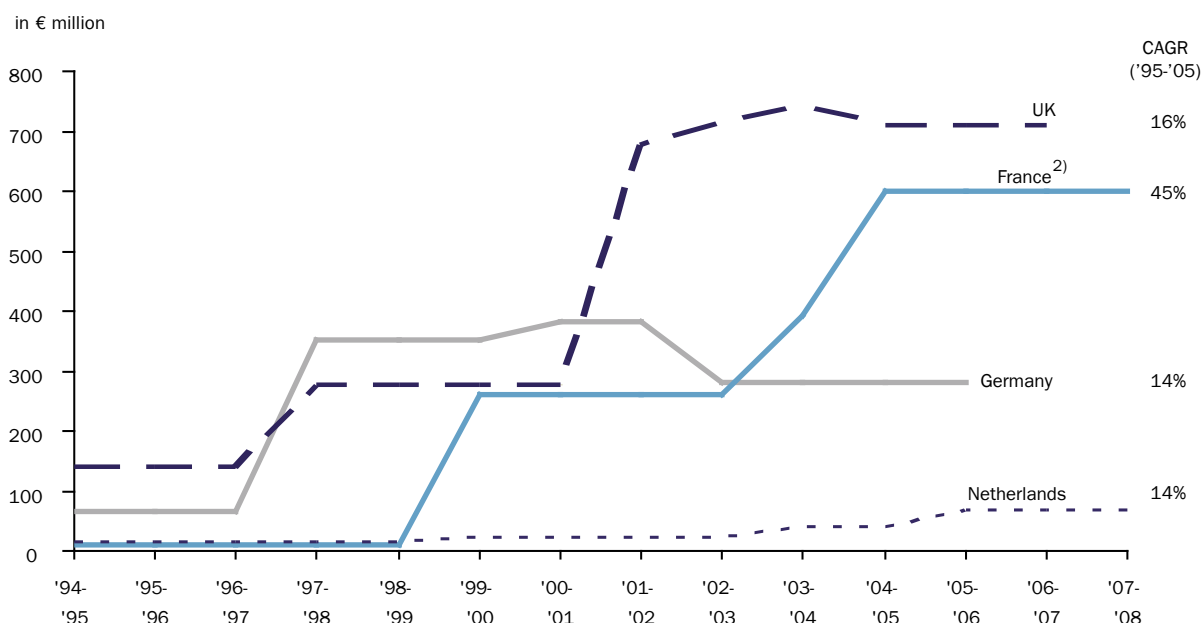
In the convergent market, different infrastructures are capable of delivering increasingly similar offerings. It is no longer necessary for a consumer to subscribe to a telecommunications provider to have reliable telephony service. The infrastructure and the underlying technology will diminish in importance; the only real interest of the consumer will be content and services. In this environment, distributors will need to differentiate themselves from their competitors. They have essentially three ways of differentiation: (1) Content offering, including on-demand content, (2) Service features (e.g., HDTV, IPG, PVR), and (3) Price. In this respect, content is by far the most important

differentiating factor for distributors because it drives the overall attractiveness of an offer and ultimately market shares. All advanced Digital TV markets show that high-quality content is required to drive penetration. In the United States, the first wave of Digital TV penetration was driven by offering consumers a significant increase in channel choices. Consumers will subscribe to Digital TV services to have access to more and better content. Service features by themselves, however, will not be sufficient to significantly drive penetration because they tend to (initially) attract niches rather than a mass audience. And they tend to be an important “add-on” to fully enjoy the content and to enhance the overall Digital TV experience. Some of the features, such as IPG, are anyway required only to cope with the increased content variety. So, compelling content is a must; service features are an important nice-to-have. Finally, price can also serve as a differentiator in the competitive environment. However,

Content will be the most important differentiator in the competition for the Digital Home

Competition for (premium) content will increase with the development of the Digital Home

Exhibit 25: Cost for Premier Soccer Rights¹⁾
(Total Cost per Country, € million)



(1) France rights cost pre '99 estimated at € m 10, based on the TF1 bid in 1999 of € m 10.7
 (2) Rights cost included total price paid for all offered packages for the national soccer leagues rights, i.e. included price paid by the different parties

Sources: E&Y, KeK, Euromarketing Crain Communications, Reuters, Booz Allen analysis

price itself will not drive penetration. It is the value-for-money that drives penetration. Attractive content at acceptable price levels will be key.

The competition for content, particularly for premium content, will increase as distributors strive to drive overall digital penetration and to capture market share in the distribution market. As illustrated above, the number of (premium) pay-TV channels is linked with the overall penetration rates of digital services in different European countries (Exhibit 10).

One of the key areas of premium content is premium soccer across Europe, and competition for soccer rights has increased significantly, driving up prices (Exhibit 25). In the United Kingdom, Sky successfully brought the pay TV model from conception to market leadership, and now faces restrictions on the premierships rights it can buy going forward. In Germany (1997) and France (1999) rights prices jumped from 10's to 100's of millions as Premiere and Canal+ entered the market. More recently premium soccer content is targeted to drive TV DSL offers: in the Netherlands Versatel TV DSL offers center on the Eredivisie (the Dutch premier league) live matches, and Belgacom aims to drive uptake

of TV over DSL through exclusive Jupiler League (Belgian premier league) coverage (Exhibit 26). Exclusive premium sports rights clearly are platform drivers, but often fail to be stand-alone profit generators for content aggregators and distributors.

The intensified competition for premium content in the future will most likely lead to additional price increases for distributors. Hence, in the competition for premium content, a distributor's scale and financial strength will become increasingly important, clearly putting telecommunication incumbents at an advantage.

Fair access to premium content supports public interest objectives

Fair access to premium content is an important prerequisite to ensure a balanced competition. The value of premium content is typically protected and sometimes enhanced by exclusivity rights. However, different degrees of exclusivity are feasible, ranging from strict platform exclusivity to the availability of rights to all channels and platforms (Exhibit 27). Different degrees

Exhibit 26: Competition for Exclusive Football Content Rights (examples)



France Telecom

**€50 m
for 3 years**

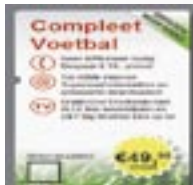
- Canal+ purchased exclusive rights to the French League for € 600 m per year for 2005 - 2008
- FT obtained wireline exclusivity for 7 out of 10 matches for a reported €50m for 2005 -2008



Belgacom

**€36 m
per year**

- Belgacom purchased exclusive rights to the Jupiler league as flagship of the TV offer it launched mid 2005
- However, national coverage not expected before end of 2006



Versatel

**€30 m
for 3 years**

- Rights have been sold on exclusive basis in advance of full-scale DSL TV roll out
- In start-up phase, only several 10's of thousand of Dutch subscribers have access to the live Eredivisie matches

Sources: Company Information, Booz Allen analysis

of exclusivity have very different (positive and negative) impacts on the distribution industry as well as on the

availability of content to consumers. Although an increasing level of platform exclusivity can drive new

Exhibit 27: Different Levels of Content Exclusivity

	Degrees of Rights Exclusivity	Pro's	Con's
Increasing Level of Exclusivity	<p>1. Platform exclusivity: Rights exclusive to one or few platforms, not made available to other platforms (e.g. Versatel with live Eredivisie in NL)</p>	<ul style="list-style-type: none"> • Supports uptake of new platforms/technologies 	<ul style="list-style-type: none"> • Limits availability of this content to select group of viewers • Creates adverse competitive landscape
	<p>2a. Full channel exclusivity and channel customer ownership: Rights are purchased exclusive by one channel. This channel holds the customer relationship (e.g. Canal+ in France)</p>	<ul style="list-style-type: none"> • Helps to create competitive channels • Distribution to large audience possible 	<ul style="list-style-type: none"> • Enhances dependency of distributors on premium rights holders • Higher complexity for users
	<p>2b. Channel exclusivity and distributor customer ownership: Rights are purchased exclusively by one channel, which wholesales content to all other platforms at reasonable commercial terms (e.g. Sky Movies and Sports in the UK)</p>	<ul style="list-style-type: none"> • Helps to create competitive channels • Distribution to large audience possible 	<ul style="list-style-type: none"> • Requires intervention by regulators on setting "fair and reasonable" terms
	<p>3. Parceling up rights by platforms: Rights are split and tendered by access platform (i.e. specific rights for 3G mobile, for DSL, etc.)</p>	<ul style="list-style-type: none"> • Ensures wide availability of the content 	<ul style="list-style-type: none"> • Limits differentiating capability for new platforms
	<p>4. All rights available to all channels and platforms</p>	<ul style="list-style-type: none"> • Widest possible availability of the content 	<ul style="list-style-type: none"> • Limits value for rights holders • Limits opportunity for new platforms to enter the market

Source: Booz Allen analysis

Exhibit 28: Platform versus Channel Exclusivity

Platform Exclusivity: Example Foot+ in France



- Canal+ purchased exclusive rights to the French League for € 600 m per year for 2005-2008
- FT obtained wireline exclusivity for 7 out of 10 matches (foot+) for a reported € 50 m for 2005-2008

Pros

- Stimulates uptake of new platform (TV over DSL)

Cons

- Limits availability of specific content to select group of viewers
- Fragmented (premium) content is spread over several platforms, which is confusing and complex for consumers
- Consumers need to adopt several technologies to have access to all available content

Sources: Company Information, Booz Allen analysis

Channel Exclusivity: Example SKY Sports in UK



- Sky Sports has exclusive content on its branded channel
- The channel is wholesaled to all other platforms (e.g. cable like NTL) at reasonable commercial terms

Pros

- Content available to all platforms should they decide to take on these channels
- Customers can choose preferred distribution platform without limits to content availability
- Wide availability of content
- Allows channels to build their brand on several platforms

Cons

- May require intervention by regulators on setting "fair and reasonable" terms

services uptake (for that platform), it may well lead to the exclusion of consumers to access the content because they have subscribed to a different distribution platform. For example, France Telecom is the exclusive wire line platform to distribute premium soccer in France, effectively depriving cable subscribers from this content (Exhibit 28). In the other extreme, the availability of premium content to all channels and platforms, which implies in effect no exclusivity at all, may lead to a wider audience reach. However, it reduces the rights value for the original content owner, potentially limiting the development of premium rights altogether. It also may limit the entry of new channels or platforms because they

are not able to differentiate themselves from existing offers. Another alternative is channel exclusivity (Exhibit 28). In this case, a channel holds exclusive content rights, but the content is distributed across several alternative platforms to ensure a wide consumer reach. Through the exclusivity agreement the channel is able to differentiate and to establish a brand, for example, Sky Sports as a brand for premium sport events. The challenge in the case of channel exclusivity is the establishment of fair terms and conditions between the channel and the distributor. Particularly, if the channel is affiliated or vertically integrated with a particular distribution platform, the fair access of third-party distributors could become an issue.

IV. CHALLENGES FOR REGULATORS IN SUPPORTING THE DIGITAL HOME 2010

Technological developments, competitive moves and consumer preferences are changing many underlying assumptions of the current regulatory regime at an

ever increasing speed. In the light of the development of the Digital Home and the convergence of media and

communications markets, policy makers need to re-think and adjust some of the foundations of traditional media and telecommunications regulation. One traditional view is that media distribution is a bottleneck.

For example, in the past, regulators, based on perceived limitations of distribution capacity and a lack of innovation in audiovisual services, often took a protective stance towards content providers to ensure that to they had a fair chance to distribute their content. This has changed in the Digital Home environment: Frequency and bandwidth are less of an issue. In fact, there might well be an oversupply of distribution capacity and an undersupply of content. The traditional paradigm is that media distributors are (regional) monopolies. Again, competition in the digital world has changed fundamentally. Competition at distribution level is clearly emerging and will further intensify. Market behavior by the distribution sector towards content providers will increasingly be constrained by new platforms entering the market. Consumers do have a choice among different media distributors and can choose the best value-for-money offer themselves.

Another traditional policy perspective is that the European audiovisual industry requires governmental and regulatory support, e.g. via broadcasting quotas for local content. In the digital world, this is not necessarily true as entry barriers for European content providers are much lower and niche channels are evolving. The increase in multi-platform competition and triple play will lead to a strongly increasing demand for new content, as well as to a sharp rise in the value of premium content rights, sports in particular. There is thus a genuine scope for market forces driving the competitiveness of the European audiovisual industry. A plethora of content will emerge as distributors strive to differentiate their content offers.

Finally, some countries, like Germany, Italy, Sweden and Austria have held the view that public support is required to push certain digital distribution technologies to the home, such as DTT. However, as distribution markets are already evolving on a competitive basis, a biased, not technology-neutral support risks creating an artificial market imbalance and lead to market distortions. In its recent ruling of 9 November 2005, the European Commission ruled against state subsidies for commercial broadcasters for the use of DTT in Berlin-Brandenburg under EU State Aid rules. Earlier, the Commission did approve support for DTT in Austria. The Commission stresses that allowable public policies under EU State Aid rules to support the transition to

digital broadcasting should be limited to interventions through (technology neutral) regulation, financial support to customers, information campaigns or subsidies to overcome specific market failures or to ensure social or regional cohesion.

The industry structure around the Digital Home is very dynamic, and technology advancements will happen rapidly. Thus, regulators face the challenge to continuously revise their policies and regulatory assumptions and adapt them to new realities.

Without reflecting the changing realities around the Digital Home, its advancement may significantly slow down with significant impact on ICT growth. A too narrow market definition may lead to erroneous decisions regarding significant market power, potentially limiting industry growth through inappropriate regulatory remedies.

For example, taking an isolated view regarding horizontal consolidation on a single cable market may well have been a justified decision in the past: a regional monopolist is being prevented from getting larger and potentially abusing its power vis-à-vis the consumer. In a converging market environment that consolidation case is getting more complex. The cable provider needs to compete against a telecommunications incumbent, who has national coverage and who is many times the size of the cable operator itself.

In this context, the same regulatory action will entrench an imbalanced market structure—ultimately also to the potential disadvantage of consumers. For example, several cable consolidation efforts in Germany have

The move towards the Digital Home has changed underlying assumptions of current regulatory frameworks

Existing regulations may hinder the advancement of the Digital Home

been blocked by the Bundeskartellamt. This has led to significantly reduced investment levels and a slower roll-out of digital services—to the disadvantage of the consumer.

The EU has realized the challenge and launched several initiatives, most notably the i2010 agenda

Homes. This is because infrastructure players need to differentiate themselves in an increasingly competitive distribution market. And one of the key differentiators will be content. Hence, as distribution has clearly ceased to be a monopoly and alternative infrastructures are available, more freedom in content acquisition, including vertical integration, would be beneficial to foster the development of Digital Homes.

During its 2000 Lisbon summit, the European Union (EU) set a goal to turn the EU into “the world’s most competitive, knowledge-based economy by 2010”. Now, halfway to 2010, there has been little progress in encouraging the spread of broadband, e-commerce, and, more recently Digital TV. Hence, governments and regulators are currently re-defining their roles in this rapidly evolving industry, facing the challenge of fostering a healthy competitive and balanced environment as well as protecting consumers’ interest. The European Commission has realized the need for proactive policies which respond to this fundamental change in technological development and its adoption by consumers. As the digital convergence becomes real, policies need to converge as well and need to reflect the new digital economy. Acknowledging the information and communication technology (ICT) sector’s significant contribution for long-term growth and employment in Europe, the European Commission also launched a new strategic policy framework, “i2010—the European Information Society 2010” in May 2005. Within this framework the Commission proposes three high-level priorities for Europe’s information society and media policies:

1. The completion of a Single European Information Space which promotes an open and competitive internal market for information society and media
2. Strengthening Innovation and Investment in ICT research to promote growth and more and better jobs
3. Achieving an Inclusive European Information Society that promotes growth and jobs in a manner that is consistent with sustainable development and that prioritizes better public services and quality of life

Similarly, vertical integration between content providers and distributors can drive the penetration of Digital

Other EU policy and regulatory initiatives reflecting the challenges of a new convergent information society include those to bridge the digital divide and to accelerate the transition from analogue to digital (terrestrial) broadcasting. On the content side, the Commission is engaged in an ongoing process of application of competition policy principles on access to (and exploitation) of content (rights) for different distribution platforms, as well as the forthcoming revision of the Television without Frontiers directive. The current regulatory framework for electronic communications networks and –services (“NRF”) will be reviewed in anticipation of ‘next generation networks’. Also the effects of convergence and multi-platform competition on currently regulated markets will be taken into account during a forthcoming review of the list of relevant product- and services markets as recommended by the Commission under the NRF.

The potential benefits of developing the Digital Home in Europe are significant. Consumers will have access to more diverse content, both educational and entertainment. Digitalization and convergence promise the emergence of niche content, fostering cultural diversity (e.g., minority content, special language content, European and local content). By adding an interactive element to the most widely used media platform, Digital TV will strongly contribute to digital inclusion: the TV has the potential to reach the masses with interactive services, which are currently only available for households with personal computers and internet access. Thus, all European consumers will have a realistic chance to access interactive services, such as on-demand content, educational content, governmental and parliamentary information or transactional alternatives. The European Commission’s endeavors to actively stimulate digital switchover policies for terrestrial television services by 2012 should facilitate this development and build the basis for wider policies presenting a coherent view on the digitization process of all transmission networks.

Concurrently, the development of Digital Homes has the potential to spur significant industry growth and the creation of jobs, all stimulated by intense competition for access to the home. This competition will require high investments because both media distributors and content providers are gearing up to develop and launch new digital services

The development of the Digital Home can become a driving force to advance the i2010 agenda with its strong ambitions to drive sustainable growth and employment in Europe through information and communication technologies

to meet consumers' expectations. Convergence calls for a significant coordination effort between media and telecommunication policies. The EU Commission has already taken a first step in the right direction by entrusting one single Commissioner with the responsibility for both the Information Society and the Media, effectively establishing a Commissioner for convergence. Similarly, Ofcom in the UK is the single regulator and competition authority for the UK communications industry, with responsibilities across television, radio, telecommunications and wireless communications services. However, most European countries continue to regulate media and telecommunications without much coordination among authorities, which makes regulation and policy making in the convergent world extremely challenging, and vulnerable to wrong decision making.

After the focus on liberalization of the European telecommunications markets throughout the 1990's, a significant part of EU information society policies were geared towards stimulating broadband deployment across the EU. Both EU policy and regulations have set important parameters to stimulate infrastructure competition across the EU, thereby driving broadband (services) deployment. In particular in countries with strong cable and DSL competition broadband penetration has accelerated and provided tangible consumer benefits (Exhibit 9). Despite major strides in boosting broadband penetration levels, the broadband policy of the EU has however not achieved the ambitious growth objectives for the European digital economy as set by the 2000 Lisbon summit. Digital divide is still an issue in most European countries – sharply in contrast to the EU's policy objective of an all-inclusive information society.

Consumers, industry players and policy makers agree that there needs to be significant work to catch up to the level of Digital TV and broadband access available in the United States and Asia, and to achieve the i2010 objectives. However, there is a sharp divide between policy makers, who favor more regulation aimed at constraining existing players, and others, who favor less regulation aimed at increasing market-led competition. Some of the regulatory instruments of the past, for example local loop unbundling, have not proven to be successful everywhere in fundamentally changing the balance of power between the incumbents and new (infrastructure) entrants in the broadband market. The need for new regulatory intervention to remedy market failures on a set of relevant markets recommended by the European Commission is currently being considered by national regulatory authorities (NRA) through national market analyses under the new regulatory framework for electronic communications networks and services (NRF). However, regulators on all levels need to bear in mind

the convergence of markets and avoid using too narrow market definitions when determining significant market

power of an operator. By extending regulation from linear to non-linear content, the revision of the Television without Frontiers (TVWF) directive runs the danger of posing unwarranted regulatory burdens, like having to observe European content and production quotas, on providers of new convergent (on-demand) services, potentially stifling the development of the emerging European new media industry. Moreover, unbalanced regulatory burdens for the provision of content on traditional broadcast transmission platforms (cable, satellite, and terrestrial) versus on new transmission platforms (IPTV) could further lead to competitive disadvantages by raising the cost of content for operators of traditional broadcast transmission platforms, potentially reducing their flexibility around programming and new business models. The directive may therefore transcend its original objective of creating an internal market for content by spilling over into the domain where it influences the competitiveness of the various providers of video transmission platforms. Hence, the directive may conflict with the new regulatory framework for electronic communications networks and services.

Fair access to premium content is also on the regulators' agendas and needs to be further monitored to prevent the abuse of a dominant market position by blocking competitive distribution platforms from having access to attractive content. Particularly in cases of an unbalanced market structure intervention may be required to prevent the abuse of market dominance in the acquisition and exploitation of premium content rights. This could, for example, be the case in undeveloped pay TV markets, in which a dominant player tries to enter into long-term exclusivity agreements to prevent market entry of new competitors. In this case, regulators may ask for a time limit of the exclusivity agreement. Similarly, "unused" content rights typically illustrate an excessive exclusivity power: A dominant player acquires content rights without using them, mainly to harm competitors and with no intent to air them. This might be the case when large operators acquire significant premium content packages without exploiting them and without making them available to other distributors ("warehousing of rights").

Many ongoing initiatives are pointing in the right direction, but some areas still need to reflect the new market realities

V. “DIGITAL DIVIDENDS” OF THE DIGITAL HOME MARKET

1. Scenarios for the Development of the Digital Home 2010

The purpose of this study is the assessment of “digital dividends” that can be gained by an accelerated penetration or likewise lost by a decelerated penetration of Digital Homes in Europe: industry growth, investments, job creation, and new services penetration.

The future development of the Digital Home promises “digital dividends” in four areas: Industry growth, investment, job creation, and services penetration

based on our market research and ongoing research and project work in the field, on the latest figures from media and telecommunication research firms, on analyst and financial reports as well as on over 30 in-depth interviews with industry experts—ranging from leading platform providers such as Comcast and content players such as MTV to senior staff of different regulatory bodies and experienced consultants. The analysis of the Digital Home includes top-down as well as bottom-up assessments of different markets and the extensive benchmarking of different European players to understand the sensitivities of the different levers such as technology, consumers, or regulation.

The market development and with it the “digital dividends” depend strongly on two areas of uncertainty in the future: regulatory environment and changes in the competitive environment. To evaluate the impact of these uncertainties we developed scenarios to answer the most critical questions around them:

Regulatory environment

What is the potential impact of a heavy regulatory environment? What are benefits and downsides if a “light-touch” regulation is put into place? Specific uncertainties and levers around regulation that have been analyzed include blocks to horizontal or vertical integration and the imposition of must-carry rules, price caps, or open network provisions.

Changes in the competitive environment

Uncertainty about the competitive environment is twofold: first, the level of competition within the distribution area; and second, the level of competition along the value chain between content producers and distributors. In both cases, a key question is whether dominant players will emerge or whether a number of equally strong players will coexist and compete for customers? The competitive environment will be affected by the level of fragmentation (e.g., of distributors or content providers) and the entry of new market players. Of particular interest is the impact of (incumbent) telecommunication players leveraging their financial strength and customer base and the impact of increasingly powerful content players. Strategies of entertainment companies such as Time Warner exemplify the potentially growing power of integrated content providers combining distribution and content assets. Finally, hardware and software producers such as Sony or Microsoft may seize the opportunity to build on their respective positions to grasp a share of the new market.

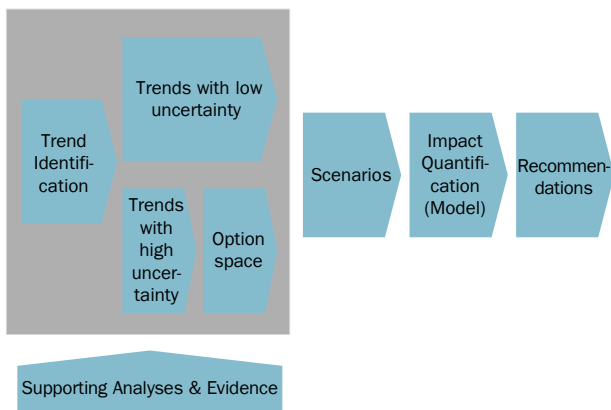
Two main areas of uncertainty affect the development of the Digital Home 2010: regulatory and competitive environment

Scenario planning is a structured approach designed to enable an understanding of complex future situations. This approach is widely used in the work environment of Booz Allen Hamilton. Scenario planning builds on the thorough understanding and analysis of industry trends already apparent in the marketplace (Exhibit 29). Certain trends are separated from uncertain trends to make uncertainty explicit. To deal with the uncertain trends described above, consistent scenarios are developed based on a deep understanding of drivers and inhibitors for the development of the Digital Home. The scenarios then build the basis for “what-if” insights, which are then translated into an economic model. The starting point of the model is backed by empirical evidence. In the course of this study, a full picture of four distinct possible futures was developed (Exhibit 30).

Advanced scenario planning has been used to analyze and quantify the impact of uncertain developments by establishing a solid fact base and focusing on key uncertainties in the development of the Digital Home

Four distinct scenarios were developed to assess the “digital dividends” associated with the evolution of the Digital Home across Europe (Exhibit 30). Each scenario represents a potential future outcome of the Digital Home market in 2010.

Exhibit 29: Scenario Planning Approach



Source: Booz Allen analysis

scenario for key decisions. It could be portrayed as a mix of light-touch regulation, as seen for example in the United Kingdom, combined with an emphasis on infrastructure based competition as seen in countries such as Switzerland or Austria. Thus in most countries, a market structure is established in which different strong distribution players compete on a relative at par basis at a national level. They invest heavily so that they are able to offer bundles and negotiate for new and digital content at eye level. These prospects attract new producers with local and niche content offerings to enter the market, and they attract customers who take up the services and thus fuel even more investments. A virtuous circle is created.





Four scenarios were developed to outline and quantify the likely evolution of the Digital Home across Europe

Scenario 1: Digital Head-to-Head Scenario

In the “Digital Head-to-Head” scenario, a level playing field leads to a fair competition of equally strong players creating a growth environment that triggers investment and job creation. This scenario implies a regulatory approach that is adapted quickly to the new market environment following a rather light-touch approach on antitrust issues and distribution constraints to allow for consolidation and fair infrastructure competition. The regulatory framework builds on a convergence market

In general, the service offerings to the consumer significantly improve in terms of quantity, quality, and price, as does the demand for new services and higher broadband speeds. Consumers are willing to spend money for the steadily increasing number of attractive digital services, adding premium and interactive packages to their basic subscription. Thus, Digital TV as well as broadband penetration rates rise sharply, while the average price per service actually goes down (as seen in the European broadband development to date, for example, in Austria and the Netherlands, Exhibit 11 and Exhibit 12).

Exhibit 30: Four Scenarios for the Digital Home in Europe in 2010

Scenario	Description
<p>1</p> <p>Digital Head-to-Head</p> 	<ul style="list-style-type: none"> • Light regulation: horizontal consolidation allowed, very limited intervention • Balanced infrastructure-based competition • Strong investment, broad service variety, quick consumer uptake
<p>2</p> <p>Industry Stalemate</p> 	<ul style="list-style-type: none"> • Heavy regulation: consolidation blocked, strict consumer protection • Digitalization stalemate (“wait and see”) • Very low innovation and investment, sluggish consumer uptake
<p>3</p> <p>Telco Mammoth</p> 	<ul style="list-style-type: none"> • National telco dominance also in digital home market • Imbalanced competition: cable blocked from national consolidation • Monopolistic prices, low service development, normal consumer uptake
<p>4</p> <p>Content Rules</p> 	<ul style="list-style-type: none"> • Imbalance along the value chain: fragmented distributors vs. dominant (consolidated) content players • Content players extracting (excessive) rents, limited investment by distributors • Low content/ service development, sluggish consumer uptake

Source: Booz Allen analysis

Scenario 2: Industry Stalemate Scenario

A stalemate closely resembles the actual situation in some European countries (for example Germany) that are seriously lagging behind in digital penetration and innovative digital service offerings. In these countries, investments are hindered by unfavorable and insecure regulatory policies. New services are not developed because build-out in the digital infrastructure is missing, and there is limited uptake of digital platform subscriber numbers which in turn again diminishes the incentives to invest.

In the stalemate scenario, we assume that those countries do not remove barriers in place and that a number of countries follow more restrictive regulative policies. In this environment, the main concern of the regulator is to control the TV platforms, mainly by enforcing short-term consumer protection measures such as must-carry rules, content quotas, price caps, and blocked consolidation. This situation leads to complacency of the main industry players and results in a lack of competition, triggering market-skimming strategies rather than large investments. In addition to the distribution and the content industries, the consumers also adopt a “wait-and-see” attitude because they have limited opportunity to experience the service and therefore fail to appreciate the added value of the digital service. Thus, in the long term, consumer benefits are greatly reduced by this regulatory approach.

Scenario 3: Telco Mammoth Scenario

The “Telco Mammoth” scenario is centered on European telecommunications incumbents such as Deutsche Telekom, France Telecom, or KPN aggressively leveraging their scale to dominate the Digital Home. Cable operators, in contrast, are blocked from consolidation on a national level and cannot fairly compete with the resources and marketing power of the incumbents. As both cable and telecommunications operators move into each other’s core markets, investments into broadband and triple play offerings first rise, only to slow down markedly when the incumbents have outplayed the cable operators. Within 5 years, subscription fees are thus expected to rise slowly, the telecommunications operators’ position playing out and enabling them to charge monopolistic prices. This, in turn, again leads to lower consumer acceptance of the digital services.

Scenario 4: Content Rules Scenario

In the “Content Rules” scenario a significant amount of value is extracted by content providers which limits

the investment opportunities of the distributors. Dominant content producers manage to steadily raise their prices because they can leverage their market scale and programming brands. Ultimately, rights owners and vertically integrated pay TV providers dictate the terms and conditions in the industry, seriously limiting the

The analysis of the “digital dividends” is based on a comprehensive quantitative market model covering 19 European countries, representing 99 percent of Europe’s TV households

infrastructure players’ abilities and incentives to invest. Because marketing investments by distributors (e.g., subsidizing STBs or heavy marketing spending) is limited, consumers only gradually sign up for the new services.

The analysis of “digital dividends” is based on the in-depth assessment of each scenario for six countries (Austria, France, Germany, Netherlands, Poland, and United Kingdom) as well as an extrapolation of an additional 13 countries (Belgium, Czech Republic, Denmark, Finland, Greece, Hungary, Ireland, Italy, Portugal, Romania, Spain, Sweden, and Switzerland). The European aggregation thus includes a total of 19 countries and 186.6 million TV households (Exhibit 31).

2. The Uptake of Digital Homes 2010 Promises Significant “Digital Dividends” in Regard to Growth, Investment, and Employment

Our analysis of the different scenarios reveals that they react very sensitively to three independent factors:

1. Regulatory environment
2. Resulting competitive environment
3. Consumer acceptance (driven partly by competition because it is a push market)

The results show that a balanced competition, in particular on the infrastructure level, is the most important

Getting the migration to the Digital Home 2010 right has significant upside on a European level—revenues, investments, and jobs in this sector will grow at a fast pace

driver of a healthy development. The Digital Head-to-Head scenario as described above shows the results that can be achieved if such an environment can be established quickly on a European level. All other

scenarios induce an overall slowdown or imbalances in the market structure that lead to less favorable results. In the following, the “digital dividends” that can be ex-

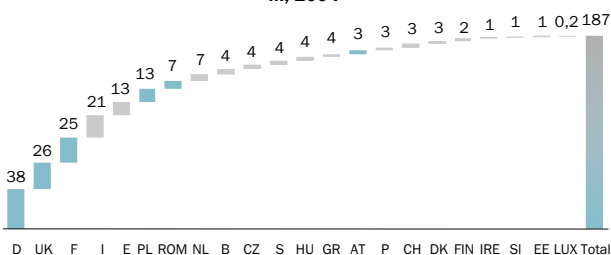
Exhibit 31: Countries covered by the Digital Home Quantification Model

In Scope Countries and Country Clusters

Cluster	Countries	Cluster	Countries
Cable weak, highly digitalized	• France	Some Cable, DSL emerging (Eastern EU)	• Poland
	• UK		• Romania
• Italy	• Czech Republic		
	• Spain	• Hungary	
Cable and DSL strong	• Netherlands	Some Cable, DSL emerging (Western EU)	• Austria
	• Germany		• Portugal
	• Sweden	• Ireland	
	• Switzerland	• Greece	
	• Denmark		
	• Belgium		
• Finland			

■ Modeled in Detail ■ Extrapolation via Clusters

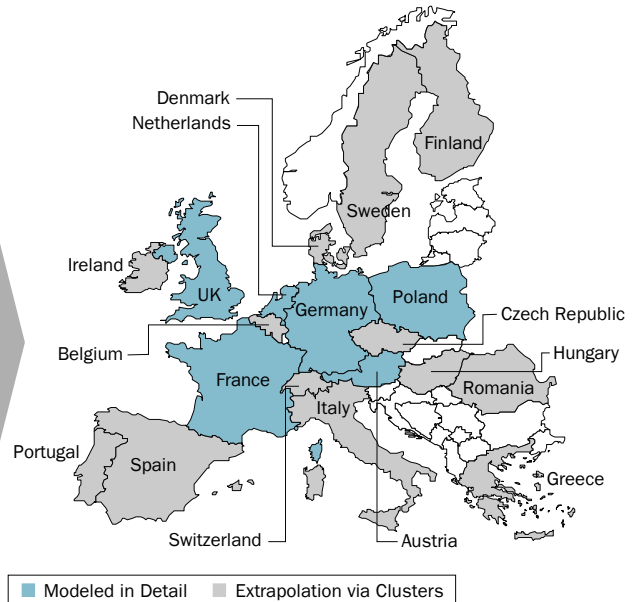
European TV Households¹⁾ - m, 2004 -



■ Modeled in Detail: 60% of TV HH
 ■ Extrapolation via Clusters: 39% of TV HH

(1) Represented are the EU 25 households plus Romania and Switzerland, but excluding Cyprus, Latvia, Lithuania, Malta, and Slovakia

Sources: Screen Digest 2005, Booz Allen analysis



■ Modeled in Detail ■ Extrapolation via Clusters

pected if the virtuous circle of a Digital Head-to-Head environment can be achieved in most countries will be described in detail. Subsequently, the focus will be on the most important drivers having a potential negative effect and the analysis of their impact on the market development.

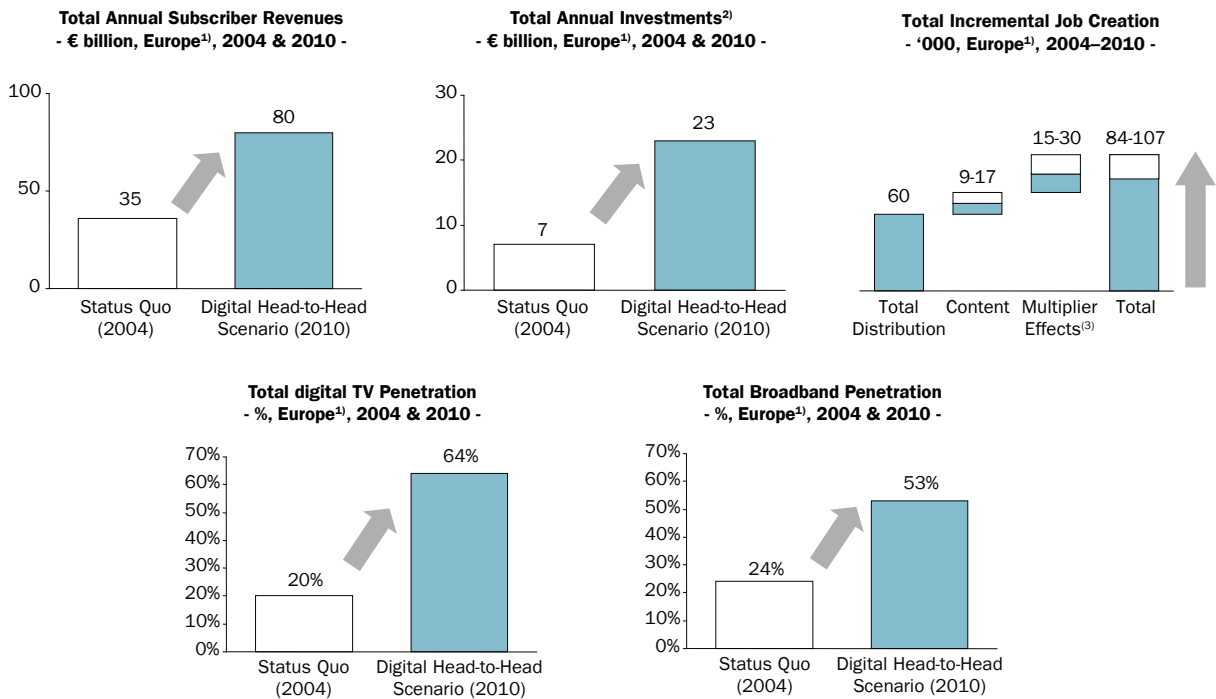
Digital TV can be expected to overtake broadband within 5 years: 64 percent (DTV) vs. 53 percent (broadband) penetration of households—Digital TV would be the major means to secure the digital inclusion

Getting the migration to the Digital Home right has a significant upside on a European level. The Digital Head-to-Head scenario shows the most favorable results and can be regarded as an ideal scenario for industry development. In this scenario, revenues, investments, jobs, and penetration rates can be expected to more than double until 2010. Compound annual growth rates will be well above 10 percent—and far higher than the average GNP growth. Access to digital services will proliferate and reach two-thirds of European households by 2010, with Digital TV overtaking broadband as the most important plat-

form into the digital world. The summary findings of the Digital Head-to-Head scenario are shown in Exhibit 32. In broadband, cable internet subscriber numbers will grow a lot faster than DSL connections—fuelled by higher speeds and attractive bundles provided by the cable operators (Exhibit 33). In the developed Digital TV market of the United States, this situation can already be seen in the marketplace: Comcast adds attractive content to internet access—VoiceMail, PhotoShow Deluxe, a multimedia player, and premium content from leading publishing houses—and delivers online gaming by leading publishers such as Atari and Strategy First. This offer includes unlimited access for consumers who can play as long as they want without additional charges. Subscriber revenues will grow at a steep rate of 14 percent per year, to reach € 80 billion by 2010. The more than doubling of the total subscriber revenue will be largely driven by selling more comprehensive

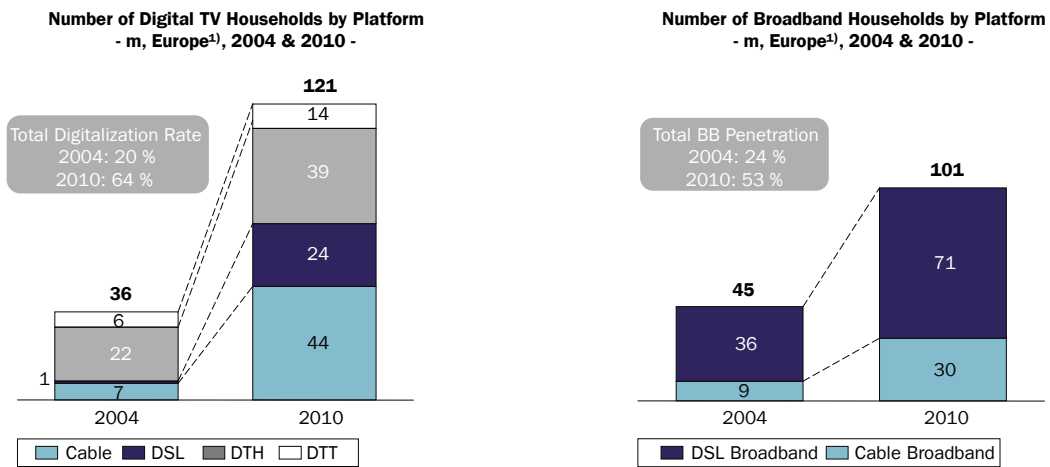
With an optimal uptake, overall subscriber revenues will reach € 80 billion by 2010 – Digital TV will account for roughly € 50 billion

Exhibit 32: Summary Results of the "Digital Head-to-Head" Scenario



(1) Includes: Austria, Belgium, Denmark, Czech Republic, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Netherlands, Poland, Portugal, Romania, Spain, Sweden, Switzerland, and UK
 (2) Investments in Capex and programming Opex
 (3) Multiplier effects capture the additional employment with suppliers and other linked activities associated with an expansion of the distribution industry, e.g. network infrastructure or STB
 Source: Booz Allen analysis

Exhibit 33: Proliferation of Digital Home Services in the "Digital Head-to-Head" Scenario



(1) Includes: Austria, Belgium, Denmark, Czech Republic, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Netherlands, Poland, Portugal, Romania, Spain, Sweden, Switzerland, and UK
 Source: Booz Allen analysis

services, not by higher prices. Up-selling is basically a function of consumer demand; more and better digital services that meet consumer demand fuel the uptake of bundles and persuade customers to upgrade their current package. This can already be seen in the United States where VoD and HDTV penetration rates rise sharply. The new or enhanced Digital Home services will include HDTV channels, premium sports and movie packages, thematic and foreign language channels, as well as interactive services such as VoD/PPV, EPG, games, voting, dating, and information services (Exhibit 34).

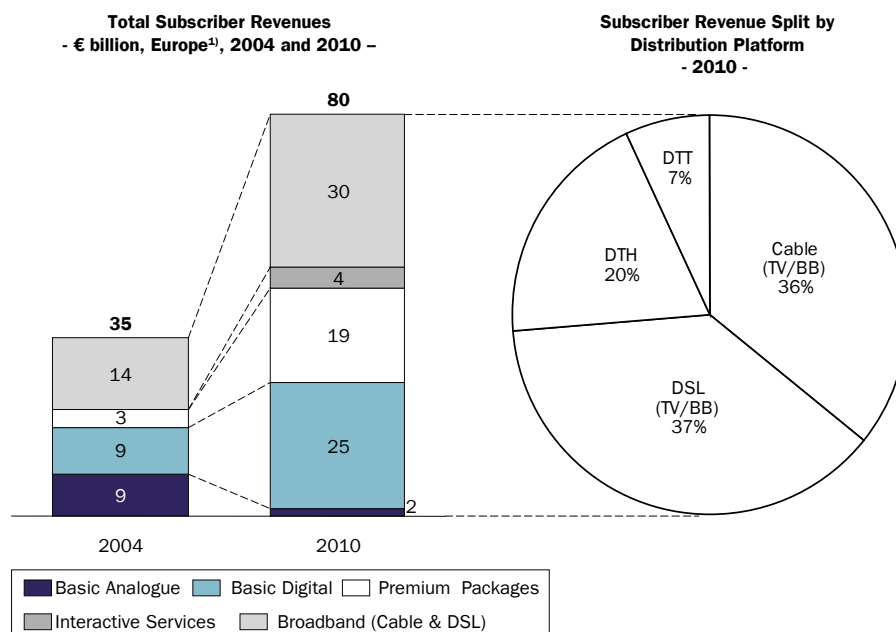
These new services will change the nature of television. Instead of being a passive entertainment platform, digitalized television will become an interactive information, communication, and entertainment platform. Apart from purely commercial services, this development also provides an opportunity for T-commerce, T-government, and other information services to reach out to a much greater number of homes. In a number of regions in Italy, people can already contact the local government by using their TV set and remote control (checking important telephone numbers and opening hours, downloading forms etc.). Similar developments can already be seen in some Asian countries and in the United States,

where for example, material from the Democratic and the Republican National Conventions as well as presidential debates were available on VoD to 20 million homes.

Proliferation of Digital Home services will lead to shifts in market shares—both in broadband and in Digital TV

As with any other large-scale change in an industrial landscape, the digital uptake will lead to shifts in market share. The number of digital satellite homes will still increase by almost 20 million despite the platform's disadvantages in a triple play environment. This reflects the very strong content position of major players such as BSkyB, operating mainly via rented satellite capacity. TV over DSL penetration is picking up, too, because of the successful up-selling of the large broadband subscriber base (once the technical problems are fully solved, which is expected to be the case from 2007 onwards). The number of cable subscribers will grow fastest; technical maturity and reaching scale quickly to be able to invest in infrastructure and content will form the basis for this success story. The subscriber numbers of digital terrestrial television will double, too, but remain on a rather low basis

Exhibit 34: Subscriber Revenues in the "Digital Head-to-Head" Scenario



(1) Includes: Austria, Belgium, Denmark, Czech Republic, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Netherlands, Poland, Portugal, Romania, Spain, Sweden, Switzerland, and UK

Note: Figures exclude VAT and excludes inflation

Source: Booz Allen analysis

given the backchannel limitations and unaligned economic interest of different stakeholders.

The last point clearly shows the importance of partnerships and alliances in the digital world. Different companies will have to align to drive the penetration of digital homes. Microsoft's and Alcatel's global alliance, announced in February 2005, can be cited as a case example: "The two companies will jointly market an integrated IPTV delivery solution using Alcatel network access equipment and systems integration services, and the Microsoft TV IPTV Edition software platform, to broadband providers worldwide". Together, Microsoft and Alcatel "expect to bring down IPTV costs, speed up the time-to-market and enable the introduction of innovative new services to consumers" (microsoft.com). Other partnerships, for example, Nokia and several local Asian broadcasters, further validate the argument. However, missing alliances or imbalances in the market will severely hinder the development of the Digital Home. If, for example, content providers or broadcasters are reluctant to produce new digital content, the network build-out to enable digital services will be slow because attractive content is important to drive consumer uptake. The power play between major broadcasters and the cable operators about simultaneous provision of analogue

and digital signals in Germany highlights this interrelation.

The delivery of more services to more customers will result in the creation of about 100,000 jobs—60,000 alone within the distribution platforms. Cable will display the highest job growth at 22,000. (This number already takes into account the associated consolidation process.) In addition, 9,000 to 17,000 jobs will originate in the content industry, reflecting the consumer demand for local digital content, the related investments of the distributors, as well as the content producers' incentives to develop innovative services. Furthermore, additional knock-on effects can be expected by the industry's suppliers and other linked

100,000 jobs would be created in this favorable environment—cable TV being the strongest job engine

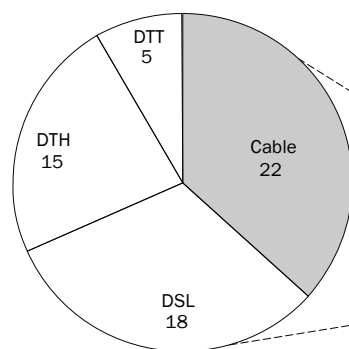
activities associated with an expansion of the distribution industry, for example, in the network infrastructure or the consumer premises equipment manufacturers. These

will account for another 15,000 to 30,000 new jobs across Europe and highlight the role of infrastructure players as key catalysts for investment and job growth in other industries.

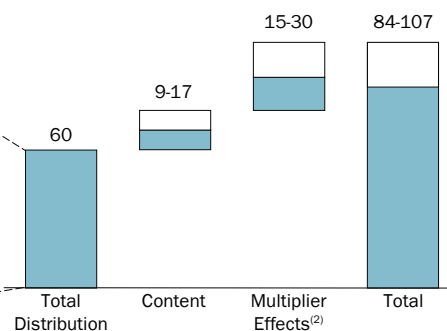
In addition to the effects on digital access and employment resulting from the expansion of the distribution industry, the level of investment is of great importance; a modern communications infrastructure is part of the

Exhibit 35: Total Job Creation in the "Digital Head-to-Head" Scenario

Incremental Jobs per Distribution Platform
- '000, Europe⁽¹⁾, 2004-2010 -



Total Incremental Job Creation
- '000, Europe⁽¹⁾, 2004-2010 -



(1) Includes: Austria, Belgium, Denmark, Czech Republic, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Netherlands, Poland, Portugal, Romania, Spain, Sweden, Switzerland, and UK

(2) Multiplier effects capture the additional employment with suppliers and other linked activities associated with an expansion of the distribution industry, e.g. network infrastructure or STB

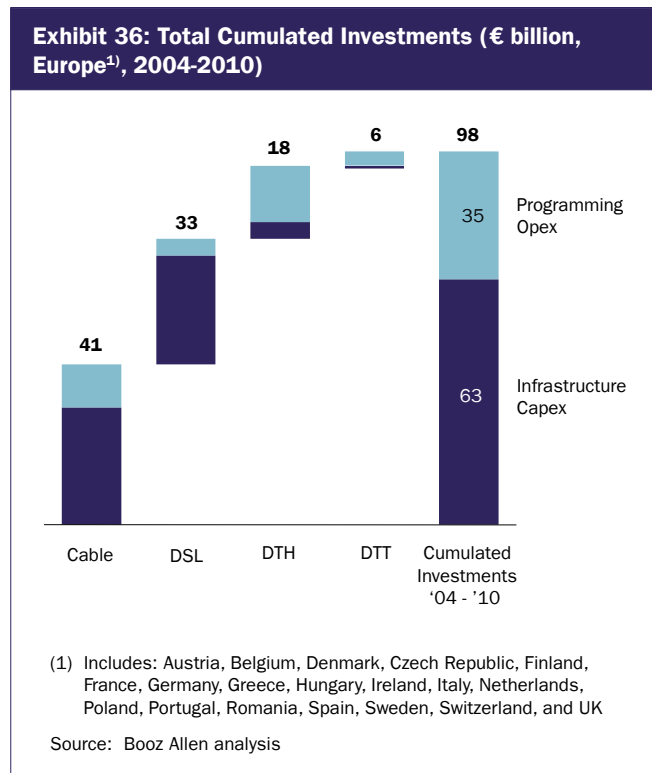
Source: Booz Allen analysis

2010 objectives because it is a fundamental enabler for other businesses to flourish. Total cumulated investments, comprising capital expenditures (capex) and programming operating expenditures (opex) spent on content, will amount to € 98 billion over 7 years in this optimal scenario. Annual investments of the distribution industry will grow from € 7.5 billion to € 23 billion between 2004 and 2010. Cable will show the largest investments of all platforms, as a result of both broadband infrastructure and digital content expenditures. DSL investments will be driven mainly by infrastructure capex (starting from only a very small TV customer basis); whereas DTH investments will be applied mainly to premium or “exclusive” content (Exhibit 36).

Total cumulated investments amount to almost € 100 billion during 7 years assuming an accelerated market development

During a 7-year period, € 35 billion of programming investments can be expected—a significant boost also for local content production

BSkyB is a prime example, showing 85 percent to 90 percent total operating expenses. Satellite capacity rental is one of the line items of the operating expenses but with almost 60 percent, programming constitutes by far the largest part thereof.



This expectation is clearly supported by past developments in the United States and the United Kingdom. Total basic program investment of the U.S. cable operators rose from \$1.4 billion in 1990 to \$9.2 billion in 2002 (compound annual growth rate of 17 percent, Exhibit 23). But the growth in content investment is not constrained to the United States. In the developed Digital TV market of the United Kingdom, a doubling of spending on original programming between 1998 and 2003—the period during which digitalization picked up—could be observed (Exhibit 9).

Industry estimates assume that 30 percent to 60 percent of all original programming expenditures go into the development of local content—amounting to € 10 billion to 20 billion in additional investments in European (local) content. This investment will significantly strengthen the European audiovisual industry.

An accelerated digitalization is beneficial for Europe as a whole. In 2004, the different penetration rates of Digital TV ranged from 2 to 6 percent (Czech Republic or Netherlands) to 57 percent (United Kingdom). By 2010, the digitally emerging countries will reach penetration rates of 45 percent and more, and the mature countries will

In an favorable environment, every country will achieve at least a 40 percent penetration rate of Digital TV— countries already highly digitalized in 2004 will come close to full digitalization by 2010

come close to saturation and full digitalization with well over 90 percent penetration. The difference between the countries will thus have become a little smaller. Especially for the Eastern European countries, the Digital Home development shows great prospects and growth opportunities—the growth rates of 2 percent to more than 40 percent penetration are in the range of well over 50 percent compound annual growth rate (CAGR). The possibility to catch up with some of their Western counterparts is an attractive outlook for them.

Developments in Germany will be instrumental in the EU's reaching its digitalization objectives

Germany is of prime importance for Europe in reaching its digitalization objectives. It is the largest European economy and with more than 38 million TV households it represents roughly 21 percent of the total European TV households. Unfortunately, it is lagging behind not only in current penetration rates of broadband and Digital TV but also in investment activity. Compared with the next largest market, the United Kingdom, Germany currently

invests only half as much in infrastructure and innovative digital content. It is crucial for the entire

A regulative regime securing a balanced industry structure is the key “qualifier” to achieve such an accelerated penetration of Digital Homes

continent that the German players overcome their investment stalemate and close the gap to developed digital economies

such as the United Kingdom or Sweden. To achieve such an accelerated penetration of Digital Homes, certain pre-requisites must be fulfilled (Exhibit 37). First, a balanced market structure is crucial for driving investments into the development of new digital services. The highest levels of investment occur when several strong national players compete on a level playing field. Second, a regulatory regime that is friendly toward investment and innovation must be in place. This approach to regulation includes considering the evolving competitive landscape in a convergent market, for example, by taking wider market definitions into account when ruling on consolidation and building the confidence among all players that regulation

will not erode the value of their investments, for example, through price regulation or open network provisioning. These two prerequisites can be viewed as “qualifiers”—meaning that these elements must be in place so that they will not obstruct the uptake of the Digital Home, but also that these elements will not drive uptake in themselves.

Delayed Digital Home penetration involves significant risks: cumulated investments of € 39 billion and 89,000 jobs could be lost or delayed

Uptake will ultimately occur only if two additional prerequisites are fulfilled—“drivers” that are instrumental to achieve the growth of investments, revenues, and jobs (and are only fully effective if the qualifiers are in place). Thus, third, distributors must make upfront investments and must take a proactive marketing approach to migrate customers to digital services. This includes tailoring the new services to customers’ wants and needs and setting the barriers to acquiring the Digital Home services as low as possible through, for example, marketing the benefits proactively or

Upfront investments, proactive marketing, and new partnership will be the key “drivers” for an optimal penetration of Digital Homes

Exhibit 37: Qualifiers and Drivers of an Accelerated Digital Home Development

Prerequisites

Investment and innovation friendly regulatory regime

Balanced market structure

Upfront investments & proactive marketing approach to migrate consumers

Emergence of new business models/ partnerships

Rationale

- Regulatory framework needs to reflect competition in the convergent market i.e., apply wider market definitions when ruling on market dominance or SMP
- Regulation needs to consider investment requirements and needs to provide investment security
- Investments drive new digital services
- Highest levels of investments occur in a balanced landscape with infrastructure competition in place
- High upfront investments are required to drive uptake
- Services should be tailored around customers’ wants and needs
- Proactive marketing is required to educate and convince customers
- Shift from revenue to subscriber revenues requires new business models
- Content players and distributors need to create win-win partnerships to develop and market new digital services

“Qualifiers”

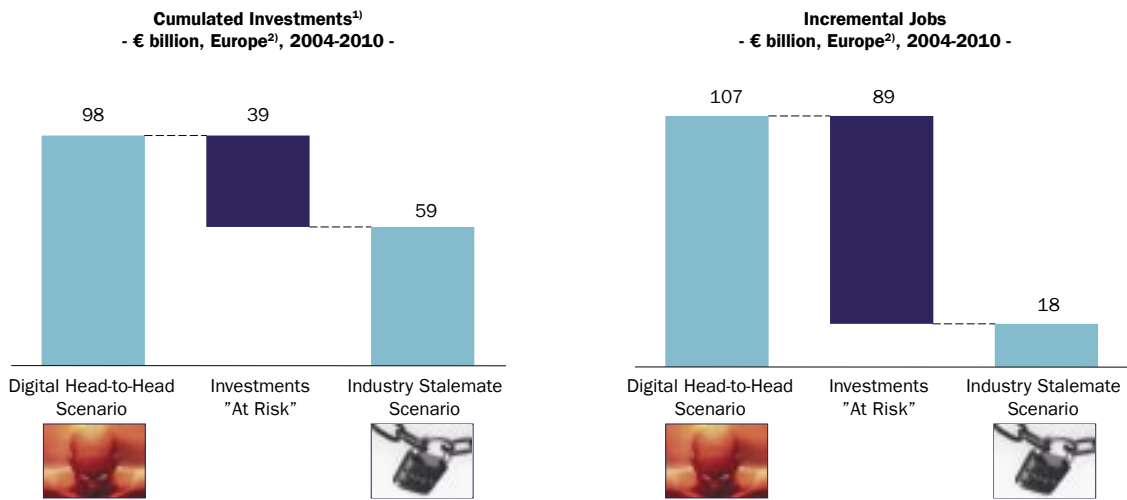
If not fulfilled, these prerequisites can obstruct the uptake of the digital home – but will not drive uptake by themselves

“Drivers”

These prerequisites are instrumental to achieve growth of revenues, investments and jobs from the uptake of the digital home – they can only become fully effective if the “Qualifiers” are in place

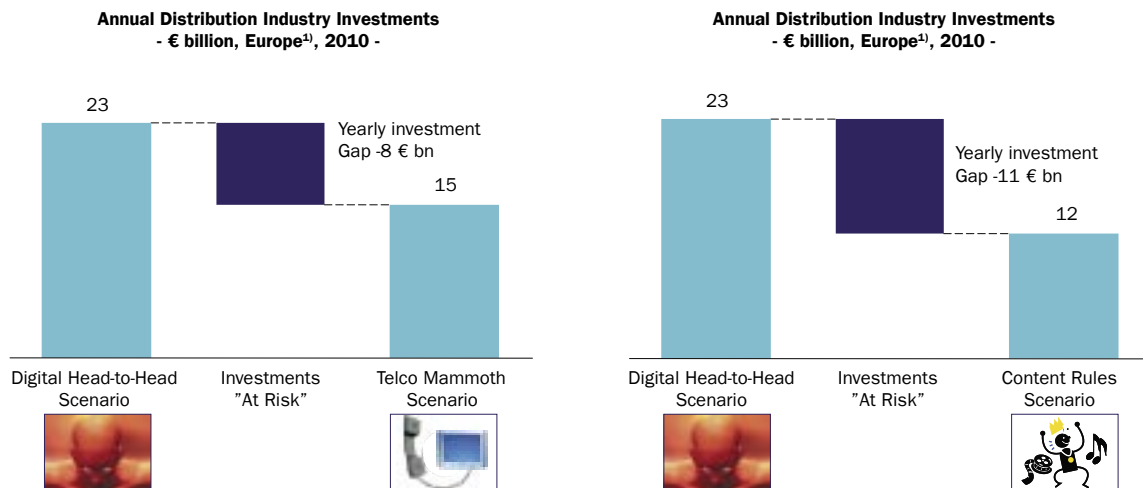
Source: Booz Allen analysis

Exhibit 38: Investments and Jobs “At Risk” in the “Industry Stalemate” Scenario



(1) Investments in Capex and programming Opex
 (2) Includes: Austria, Belgium, Denmark, Czech Republic, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Netherlands, Poland, Portugal, Romania, Spain, Sweden, Switzerland, and UK
 Source: Booz Allen analysis

Exhibit 39: Investments “At Risk” in the “Telco Mammoth” and “Content Rules” Scenarios



(1) Includes: Austria, Belgium, Denmark, Czech Republic, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Netherlands, Poland, Portugal, Romania, Spain, Sweden, Switzerland and UK
 Source: Booz Allen analysis

subsidizing set-top boxes (as BSkyB does). Fourth, all players must be aware of, and prepare for, new business models and partnerships. Although the decrease in traditional (advertising) revenue streams will drive the

One player dominating the market too strongly poses a serious threat to the development of the Digital Home, with considerable impact on investments and jobs

need for new business models, win-win situations will have to be created for content players, broadcasters, and distributors so they can successfully develop and market the new digital services (Exhibit 37).

3. Delaying the Digital Home Greatly Affects the “Digital Dividends”—Regulation Being the Key Enabler or Barrier

Correctly managing the migration to the Digital Home offers significant benefits for European society; alternative scenarios clearly show the potential investments or jobs that are at risk. The development of a new market requires optimal management by companies and regulators as well as the interplay of technological innovations and consumers. Of the different drivers, including technology, consumers, and regulators, the regulatory regime has the highest potential to slow down the development. If these issues are resolved, then the industry is in the driver’s seat to determine the speed.

3.1. Failing to adapt the regulatory framework fast enough will have significant impact

In the Industry Stalemate scenario, the “wait-and-see” attitude of consumers and industry players will lower cumulated investments by € 39 billion compared with the Digital Head-to-Head scenario. This translates into 89,000 fewer jobs compared with the “Digital Head-to-Head” scenario (Exhibit 38). The main reason for the huge differences in relation to the optimal environment is the missing infrastructure build-out. The lagging digital infrastructure constrains platform providers to offer innovative and bundled services. This in turn does not convince the consumers to switch to digital, which lowers the incentives for producers to develop digital content. No stakeholder will make the first move.

3.2. Imbalanced industry structures will slow down the development towards the Digital Home

In both the “Telco Mammoth” and the “Content Rules” scenarios, market imbalances will distort industry development. Both of these imbalances in the Digital Home market will ultimately lead to monopolistic market structures, complacency, and value extraction by the dominating players. Missing incentives and capital of the distribution industry will lead to fewer investments in both innovative content and infrastructure. The “winners” will be the telecommunications incumbent and the content industry, respectively, but the “losers” will be all European societies with lower annual investments of € 8 and 11 billion, respectively (Exhibit 39).

VI. RECOMMENDATIONS

An accelerated development towards the Digital Home will be key to advancing the EU's digital economy objectives as set out in the i2010 agenda. Significant "Digital Dividends" are to be gained. To achieve the objectives of a digital economy, both policy makers and industry players need to act.

1. Recommendations for Policy Makers and Regulators

The regulatory regime has a particularly strong impact on development of the market, and the stakes are high: unfavorable regulatory decisions could prevent or delay accumulated investments of up to € 39 billion (2004–2010), leading to a significantly slower growth in employment in the industry (2 percent versus 8 percent per year). In the convergence space, the negative impact of "wrong" decisions will affect a much larger market than ever before. Decisions need to be made both in light of converging markets and from a European perspective. The subscription fees of television and broadband internet constitute a European market of € 35 billion in 2004, and the industry accounts for roughly 100,000 jobs. Fixed-line voice revenues account for another € 90 billion, and mobile communication for roughly € 125 billion. Therefore, policy makers need to be aware of the wide impact of their decisions. The margin for error is decreasing.

To foster the development of Digital Homes in Europe, policy makers need to act on four key themes:

1. Refocus attention from broadband to convergence/DTV
2. Ensure a balanced market structure and competition in a convergent digital world
3. Balance consumer protection with long-term investment and employment objectives
4. Rebalance regulation in favor of infrastructure-based competition

1.1. Refocus Attention from Broadband to Convergence/DTV

To date policy makers and regulators have by and large focused on broadband to drive their digital economy objectives. Policies were geared towards stimulating broadband deployment across the EU. Our analysis shows that Digital TV becomes increasingly important and can be expected to overtake broadband penetration by 2010. As Digital TV becomes the main enabler of

an inclusive digital society, a more balanced policy perspective on broadband and Digital TV is justified. Policy makers and national governments need to realize the importance of the analogue to digital migration and, hence, should support the migration efforts initiated by industry players.

1.2. Ensure a Balanced Market Structure and Competition in a Convergent Digital World

The scenario analysis shows that a balanced head-to-head competition among strong national players leads to the greatest economic benefits, the greatest digital penetration, and the greatest proliferation of new services. In contrast, uncontested dominance (e.g., by telecommunications, cable, DTH, or content providers) in the battle for the Digital Home leads to significantly lower investment and job creation levels as well as reduced variety in services. Five key action points will help to achieve a balanced industry structure:

1. Broaden market definitions to reflect the convergence of TV, broadband, and telephony markets
2. Allow national consolidation to enable the creation of strong national distributors
3. Avoid unbalanced support for specific distribution technologies to prevent distortion in the development of the industry
4. Allow content exclusivity and vertical integration to enable differentiation—intervene only if market power is abused
5. Consolidate fragmented regulatory bodies

The convergence of markets (TV, broadband, telephony) requires new definitions for "relevant markets", especially when applying concepts such as SMP. Formerly largely separate industries, such as telecommunications or television distribution, now compete directly in their respective core markets and combine the different services into one Digital Home industry. In this new playing field, economic size becomes increasingly important—especially for former niche players now having to compete against formerly monopolistic telecommunication incumbents. But the scale of the players has to be measured against the converging basis. These new market realities have to be taken into account, particularly when judging market dominance or the abuse of market power.

Broaden market definitions to reflect the convergence of TV, broadband, and telephony markets

Allow national consolidation to enable the creation of equally strong national distributors

In most European countries, both DTH and telecommunication players provide their services on a

national level, whereas cable operators function under a regionally constrained franchise model. At the same time, scale within a country is crucial to enable large up-front investments in the convergence space. To ensure equal and fair competition, cable operators need the freedom to build scale and to establish a national presence as well. Looking at fixed-line telephony today, different entities already compete with the same service in the same market for the same customer: Telecommunication incumbents, cable operators, and potentially VoIP service providers such as Skype. But the size of the companies is of a strikingly different magnitude—thus preventing the smaller players from consolidating means to extrapolate the unequal situation of today into the future. In contrast, an even distribution of investment and marketing power leads to effective competition and benefits for all: The consumer has more choices at lower prices, the industry achieves much higher levels of investments and jobs, and society achieves a higher digitalization.

During the past decade, the UK's cable industry has consolidated significantly: 29 companies (1992) first consolidated to 13 (1997) and then to 2 (2003). Most recently, the remaining two operators (NTL and Telewest) announced their merger to be able to better compete with BSkyB and British Telecom on a

Avoid unbalanced support for specific distribution technologies to prevent distortion in the development of the industry

national level. Similarly, early deregulation in the United States (Telecommunications Act, 1996) led to a consolidation wave among cable operators, providing the scale for significant content investments. Basic programming investments rose from \$1.4 billion (1992) to \$9.2 billion (2002). These investments have led to U.S. cable operators offering a wealth of advanced digital services including, but not limited to, VoD, PVR, EPG, HDTV, information services, and games. A similar development can be expected in Europe.

Rapid consumer migration to digital must be achieved to break through the industry stalemate, to fuel investments to achieve industry growth and digital inclusion. There is no reason why the digital platform distribution (DSL, cable, DTH, and DTT) should resemble the analogue market shares. Instead, regulators should take care that consumers are able to make their distribution

platform decision on the basis of full information about the respective platform's capabilities. Satellite is not yet capable of a full VoD service, digital terrestrial does not offer broadband internet, and the technology of TV over DSL is in the early stages of mass market roll-out. Finally, rapid commercial success of one platform triggers strong reactions from the other distributors, as seen in the United States, where a strong digital satellite offering prompted the cable operators to invest heavily to sustain competition (including investments in cable infrastructure of roughly \$ 1,300 per customer). Policy makers should therefore support rapid consumer migration to the Digital Home regardless

Allow content exclusivity and vertical integration to enable service differentiation—intervene only if market power is abused

of the technology of the distribution platform, for example, through publicity campaigns or clear analogue switch-off dates. Hence, digital switchover should be technology neutral. However, most countries have a biased focus on terrestrial switchover only. Similarly, an unbalanced support for specific distribution technologies should be avoided (e.g., subsidies for DTT only). It distorts a healthy market development and is not in line with EU policy—as the recent ruling of the European commission on the DTT subsidies in Berlin-Brandenburg, Germany, has clearly shown. The shift from analogue to digital is a risky challenge for all industry players; any unequal support of technologies and/or platforms may lead to an imbalance in industry structure and a slowdown of overall market development.

Policy makers also should ensure balanced and fair competition along the value chain, namely, between content providers and distributors. Our scenario analysis suggests that a severely unbalanced dominance by content players can also lead to significantly lower levels of investments by distributors (€ 11 billion of yearly investments at risk in the "Content Rules" scenario). This in turn leads to a decrease in the development of new content and services, which slows down overall Digital Home uptake and reduces consumers' choices.

In general, the content industry and the distribution industry are in a state of mutual dependency: the content players need wide reach and therefore strong distribution players; whereas distributors in turn require strong content as the basis for an attractive value proposition. Traditionally, near monopolistic market structures in distribution put the platforms into an advantaged position, and they were thus prevented from entering the content market. But it is time to rethink this dependency in the convergence space because distribution will no longer constitute such a significant bottleneck. On the contrary, with competing

infrastructures in place, content, in particular premium content, will be a key differentiating factor. Today's changing reality paves the way for a new relationship and integration of content and distribution. Our analysis suggests that market forces will lead to a balanced relationship between content providers and distributors in most cases. Therefore, only extreme cases of unfair blocking of platforms or unfair treatment of own versus other content will require regulator's attention.

Consolidate fragmented regulatory bodies to enable a holistic view of the convergence market

New services such as VoD and PVR will give consumers greater control over their viewing experience; they can decide when they want to watch what kind of content. Similarly, broadband offers consumers access to a wealth of information and services, which they can retrieve and control at their discretion. To foster the development of new digital services and to enable differentiation, regulators should generally allow vertical integration between content providers and distributors. Policy makers should intervene only if a dominant position in content is unfairly leveraged in distribution or, alternatively, if a dominant position in distribution is unfairly leveraged in content. The basis for a dominant position should reflect the new reality of a convergent market.

Differentiation through content exclusivity will help to drive penetration for certain platforms. However, unbalanced content exclusivity may in some cases adversely affect fair competition and long-term industry structure. Hence, policy makers should restrict content exclusivity only if significant market power is abused. As mentioned earlier, the definition of abuse of significant market power should be made in the context of a convergent market. To prevent abuse, regulators may want to intervene to limit the scope and length of an exclusivity arrangement or to oblige rights holders to make content available to other players at fair rates. The regulatory intervention in the Telepiu/Stream merger in Italy is a good example case for ensuring fair competition: The merged DTH entity is not allowed to acquire (and warehouse) exclusive rights for other distribution platforms—to the benefit of fair competition and ultimately the consumer.

To date, frequently this Digital Home market is regulated by different authorities (e.g., one regulatory body for telecommunications, another one for media) in isolation. However, the convergence of TV, broadband, and telephony will require much closer coordination—if not even a merger—between different regulatory bodies. For example, the United Kingdom has reacted positively to reflect these new challenges of market

convergence by merging five media and telecommunications regulatory authorities—the Broadcasting Standards Commission, the Independent Television Commission, Ofcom, the Radio Authority, and the

Radiocommunications Agency—into a single entity (Ofcom) in 2003. Ofcom is now the single regulator and competition authority for the UK communications industry, with responsibilities across television, radio, telecommunications and wireless communications services. This allows Ofcom to have a holistic view of market dominance or of the abuse of market power across all communication industries. Similarly, the EU Commission has entrusted one Commissioner with responsibilities for both Information Society and Media.

Very often this consolidation is difficult because of entrenched structures or a division of legal competencies as in Germany where telecommunications is under federal legislation whereas TV resides within the Länder. Nevertheless, solutions have to be found because market and technological developments are in danger of being severely slowed down.

1.3. Balance Consumer Protection with Long-term Investment and Employment Objectives

Policy makers face the challenge of balancing short-term consumer interests (e.g., low prices) with midterm objectives concerning economic growth and employment. For the regulator, the need to support this balance drives the need for a coherent regulatory framework across services (TV, broadband, telephony) and distribution infrastructures (cable, DSL, satellite, terrestrial), as well as along the value chain (content versus distribution).

Regulatory decisions must be put into context, and the long-term implications must be taken into account. The focus on long-term industry development creates greater service variety, which increases consumer choice in the long run.

Focus regulatory action on long-term industry development to achieve maximum benefit for society

There is no reason to allow for excessive pricing in monopoly-like situations. But when making decisions on consumer protection, policy makers need to make a trade-off of short-term gains against positive long-term effects on investments, jobs, and industry structure. They should ensure that short-term measures (e.g.,

price regulation, network access) do not constrain investments in long-term growth, in particular in a highly competitive environment. For example, in the case of price regulation, regulatory bodies need to reflect that regulated price levels have an impact on the cash flow of distributors and thus their ability to invest. In the time of isolated regional franchises, this was less of an issue. But in the convergence market, cable operators need significant investments in future growth to avoid being disadvantaged in regard to other platforms (DSL, DTH) that often have a much higher cash flow basis to operate from. Strict short-term consumer protection measures will lead to reduced penetration of the Digital Home, which in fact potentially offsets the intended benefits of such measures.

Regulatory decisions thus need to be put into the wider market context and consider the impact on related markets as well as the mid- to long-term perspective of the entire industry.

1.4. Rebalance Regulation in Favor of Infrastructure-Based Competition

Infrastructure-based competition leads to the best results in investments and technological innovation as well as in in-country job creation. Strong infrastructure-based competition has made Switzerland one of the leading broadband and Digital TV countries in Europe. Switzerland's Cablecom offered broadband services as early as 1998 and telephony in 2003. Digital TV offerings include more than 130 digital channels and several premium packages (movie channels, foreign language packages). Similarly, Austria's telecommunications regulator favors strong infrastructure competition in broadband.

Stimulate infrastructure-based rather than service-based competition to foster consumer choice

In contrast, service-based competition typically leads to lower investments by infrastructure providers because they cannot sufficiently protect their assets. Job creation levels may also be lower, and jobs are more likely to be created out of, instead of within, the country in question. In addition, regulators need to be aware that service competition on a network may lead to degradation in quality of service, both to the service provider's customers and the infrastructure provider's customers. In addition, opening up networks to third-party service providers also limits the effective protection of content rights because new players from other legal territories may enter the market. To drive in-country innovation and industry growth, policy makers need to reflect the require-

ments of infrastructure providers to protect their assets and investments. Increasing service competition on distributors' infrastructure will deter them from making significant upfront infrastructure investments because they may not be able to earn an adequate return on those investments. As infrastructure investment is reduced, the overall penetration of the Digital Home will be lower. Because the Digital Home is far more than just another entertainment fad, the impact of a slow penetration is immense: substantial investments in digital content and new businesses are delayed, small and medium-sized enterprises are deprived of up-to-date communication features, and the digital inclusion is not realized to the extent possible.

Provide sufficient investment security to increase industry incentives to upgrade the networks

2. Recommendations for the Cable Industry

The cable industry has to cope with fast-changing rules of the game. It used to employ (often) a heavily regulated, utility-driven business model: delivering one well-engineered product to as many homes as possible. The pace of the customer base expansion was driven largely by the infrastructure build-out. Today, the industry finds itself in a consumer product market in which companies have to react with many different products to diverse and changing consumer needs. And for every one of these products, several credible competitors try to secure their part of the market. To successfully drive the development of the Digital Home, cable operators thus face three key challenges: making large upfront investments, capturing the mass market quickly, and changing revenue streams.

Making large upfront investments: The move to the digital world requires large investments from the cable distribution industry, including network upgrades, consumer premises equipment, marketing campaigns, and (jointly with content producers) new digital content and interactive services. Most of these investments must be made up front, leading to significant risks and uncertainty in cable investment business cases. In addition, the majority of these investments represent fixed costs, that is, they are by and large independent of the number of subscribers. This poses particular difficulties for the more fragmented cable countries.

Capturing the mass market quickly: Most consumers who have used Digital TV services have expressed a strong interest in these services. Positive signs about consumers investing in Digital Home equipment to

enhance their viewing and broadband experience are increasingly evident. However, consumers who have not yet experienced digital interactive services, such as a PVR, EPG, and on-demand content, do not directly appreciate their added value. Thus, a significant challenge is to stimulate demand in the mass market for the Digital Home.

Changing revenue streams: The digital world creates the opportunity for new digital services and hence new revenue streams such as targeted information, online gaming, or video telephony. Bringing these new information and entertainment services to market requires the joint effort of many players along the value chain—managing numerous partnerships and establishing fair revenue and/or cost sharing models will be a challenge. Besides the rising complexity with new services and partnerships, the Digital Home market will be a completely new competitive ground for many of the companies: Telecommunication firms have had limited experience with television content to date, and cable providers in many countries are still quite unfamiliar with the telephony market. New capabilities will have to be built up quickly.

These challenges and the outcome of the scenario analysis lead to six strategic imperatives for the cable industry to heed to play a lead role in driving the Digital Home in Europe:

1. Understand the Customer: Develop Consumer-Driven End-to-End Entertainment Offers
2. Serve the Entire Digital Home: Offer Compelling Bundles
3. Give Consumers What They Want: Build Marketing and Sales Capabilities
4. Give Consumers What They Want: Proactively Migrate the Customer Base
5. Size Matters: Build In-Country Scale
6. It's a Team Play: Build New Business Models and Partnerships for Superior Digital Services

2.1 Understand the Customer: Develop Consumer-Driven End-to-End Entertainment Offers

To create customer pull for digital services and to deliver on the promise of more and better digital services, cable operators must develop attractive end-to-end entertainment offers. These can be built around three key differentiators: (1) Content, (2) Features/services (e.g., HDTV, PVR, IPG), and (3) Price. The most important differentiator is content because it will drive penetration and will be a key determinant for market shares. Initial opportunities reside in proposing a solid basic digital content package that offers more than the analogue package at the same price. For those subscribers wanting more content variety and new services, the possibility

to upgrade will be crucial. This requires tailoring of offers to specific customer segments. Consumers need to experience a clear added value from the enhanced digital services, well beyond the current analogue offer and independent of their current TV platform. The industry should focus on those services that have the potential to generate consumer pull (e.g., VoD, HDTV) in addition to attractive content. The distribution industry should also focus on developing services that are not network dependent but that will constitute an integral part of the digital viewing experience (e.g., EPG, PVR).

The cable industry is especially well positioned to drive this development. It has very close relationships with traditional and innovative content producers as well as broadcasters. This proximity to the TV entertainment sector can be leveraged to successfully bring new products to the market and establish a credible brand for the digital world. Cable's reputation for state-of-the-art television and high-speed internet connections is a very good starting point. But unlike with former experiences in the analogue world, the cable industry will have to learn to cope with offerings and services that will not be taken up by customers. Maybe online voting fails to reach the high expectations associated with this service. Then the price and the service itself will have to be modified and adjusted to the customers' needs. The development of a whole range of different services will have to be tracked over time and managed with the growing customer base. A single killer application to migrate all the customers to digital will not exist, but a complex set of product features needs to be in place and managed successfully: A variety of new services (VoD, HDTV, EPG), premium content, new hardware such as STB and PVR, as well as the right pricing for all these applications.

2.2 Serve the Entire Digital Home: Offer Compelling Bundles

The Digital Home will be characterized by integrated triple play services: telephony, broadband internet, and TV provided by a single company. This convergence of different services onto single platforms makes differentiation by technology obsolete. Of course, some technological differences will persist, but consumers know they can get a good and reliable basic Digital TV offer from both satellite and cable operators. And DSL will be joining soon. In the United States, competition already centers on bundles, and the best service in which an integrated triple play offer with a single bill and a single point of contact makes all the difference. Of course, besides the service, offering an attractive price will be key to satisfying the consumer. And over time, as consumer preferences shift and technology evolves, these bundles will have to be modified. In the

future, mobile telephony will most likely be a must, and a convincing home network solution will be the next major milestone.

2.3 Convince Consumers: Build Marketing and Sales Capabilities

Although marketing power is an important building block of the digital success, a compelling sales strategy is another. The cable industry to date has by and large lacked sufficient customer orientation in many regions. However, the development and the successful launch of new entertainment offers requires deep marketing and sales capabilities. Cable operators need to establish a stronger consumer focus clearly addressing the consumers' wants and needs in their service offering and market communication. This requires a sophisticated customer segmentation approach and the development of offers tailored accordingly. Not every consumer might immediately opt for the full triple play offer, and not every consumer might be willing to pay the same price. Technology arguments do not resonate with consumers. Instead, consumers will require a significant amount of education on the advantages of new digital entertainment services. To proactively penetrate the market and to drive rapid digital uptake, cable operators need to develop and implement focused marketing campaigns. In addition, increased competition in a convergent market will require cable operators to build a strong entertainment brand, both for their products and for their company. An area in which many players are lagging behind new potential competitors.

2.4 Give Consumers What They Want: Proactively Migrate the Customer Base

The enhanced marketing and sales capabilities must drive a sophisticated digital migration strategy. Targeted marketing and migration, for example, by neighborhood or by customer segment, can ensure a favorable economic return as well as a timely rollout. A rapid execution will be crucial to minimize the risks associated with the large upfront investments. However, the rollout speed needs to be adjusted to address competitive pressures and cable franchise attributes (e.g., other digital platforms, national regulation).

2.5 Size Matters: Build In-Country Scale

Economies of scale will be increasingly important. Only a consolidated cable industry will have the scale and resources to compete with alternative platforms having a national footprint. Thus, the geographic

expansion to reach a substantial number of a nation's households—or even full national coverage—should be a priority for cable operators. To extend coverage, cable operators need to expand through acquisitions (cable, alternative platforms) and/or build additional infrastructure, possibly with alternative distribution technologies. In the expansion, operators should prioritize in-country scale expansion over footprint extension into new markets.

The main reason for the need for scale is the upfront investments associated with the migration to digital. The necessary infrastructure is but one important factor, the other factors being the substantial marketing efforts and the buying power. To secure the access to (premium) content, cable operators have to compete against well-established satellite-based operators such as BSKyB or Canal Plus. Driving the uptake of their platform with exclusive content has been their strategy for the past decade. But even their buying power is by far surpassed by telecommunications incumbents. If they decide to enter the Digital Home market with their huge cash flows, alternative platform operators will have to offer superior products and a clever market strategy. But first and foremost they need adequate size.

2.6 It's a Team Play: Build New Business Models and Partnerships for Superior Digital Services

The digital migration will create new business opportunities that will lead to shifts in business models and in the industry structure as a whole. As new players emerge and enter the market (predominantly in the content and services arena), traditional players will need to adapt. This will require the development of new win-win business models with content/service providers and broadcasters that establish fair revenue and/or cost sharing schemes. A long-term commitment to partnerships and cooperation may help to mitigate the inherent risks in this emerging digital landscape. Beyond the cooperation with content and service providers, cable operators need to reach out for partnerships with various hardware and software providers to develop easy-to-use customer equipment. Easy navigation in the converging Digital Home is crucial to ensure a rich consumer experience and ultimately to drive uptake. Regulators are challenged to secure a level playing field and investment security for all players willing to invest in order to make the Digital Home a reality. Once this is granted and all players take advantage of this market opportunity, Europe will look at a very exciting decade of moving into the digital age.

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