CONTENTS

Preface 4

1. Overview of Internet & TV 6
1.1 Web TV, IPTV and Hybrid Reception Devices („Smart TV“) 7
1.2 Consumer Electronics and Connectivity 7

2. Forms of Interactive Television 9
2.1 Overview of the various Hybrid TV Packages 9
2.2 HbbTV as a Standard: Origin, Application and Outlook 9
2.3 Display and Use of Web Services on Smart TV 15
2.4 Business Models and Advertising Types with Smart TV 17
2.5 Over the Top („OTT“)-TV: Important National / International Players 20

3. Results of Hybrid End Devices / Smart TV WG 22
3.1 Commercial Requirements 23
3.2 Content Guidelines 25
3.3 Workshop „Smartphone to Smart TV: Apps conquer TV“ 26
3.4 Symposium on Second Screen: Perspectives on Smart TV and Social TV 27
3.5 Usability – Studies on Operation Concepts 28
3.6 New Focuses of Work and Open Questions of the Smart TV WG 32

4. Market situation, Viewer Acceptance & Forecast 34
4.1 Device Sales, Turnover Development 34
4.2 Smart TV and Viewer Acceptance 34
4.3 HbbTV and Market Development 39
4.4 Trend Forecasts and Future Opportunities 39

5. Glossary: Important Terms and Abbreviations 42

6. Sources 47

7. Appendices 47

Masthead Publisher, contact, content, authors, liability 56
An important stimulus for new digital TV

For three years, the trend has continuously been to connect consumer electronics devices to the Internet. At the start, this was called „Hybrid TV“ and in the various international markets, it was also called „Connected TV“. However, the collective noun „Smart TV“ has now gained acceptance. Modern TV screens, Blu-ray players and digital receivers enable „smart“ use. For this, the devices must, additionally to receiving broadcast, also be connected to the Internet via LAN or WiFi.

According to GfK Retail & Technology, 11 million hybrid devices had been sold on the German market in the middle of 2012. Approximately 2.8 million of these were HbbTV-capable devices. The ZVEI Consumer electronics specialist association commissioned the GfK consumer panel, nonfood & retail division with carrying out a study; the results of which were made available in May 2012. According to this study, 59 percent of the Smart TV devices on the market were connected to the Internet and 76 percent of the viewers also used the new technology regularly.

Alongside various systems that have been developed by the device manufacturers that are generally based on standardised programming languages, the international standard „Hybrid broadcast broadband Television“ (HbbTV for short) has established itself for the connection of broadcast with online services. HbbTV was standardised in June 2010 by the international standardisation organisation ETSI and is used now by many TV programme providers and nearly all device manufacturers.

The market development is very dynamic and has been the focus of the German TV-Platform’s working group „Hybrid end devices for the integration of broadband and broadcast“ since May 2009. It has meanwhile been renamed the „Smart TV“ working group. The working group has the goal of promoting the development of the market for Smart TV end devices and the corresponding services in Germany. This is done whilst taking into account the various business models of the entire value-added chain.

With the aim of educating the public, the WG has developed the brochure „Hybrid TV“; the third updated version of this was published for the IFA in 2011. Several members of TV-Platform presented clear examples of their hybrid portals and end devices alongside an overview and explanations of Hybrid TV for both consumers and interested parties. The „Smartphone to Smart TV: Apps conquer TV“ workshop that the German TV-Platform hosted in April 2011 was particularly successful: The presentation by the Ilmenau Technical University on the usability of hybrid content was paid particular attention. This resulted in TV-Platform issuing a further research job to the Ilmenau Technical University in 2011. This showed that there are still various ways to access content; this indicates that there remains plenty of potential for improvement.
Right from the start, the WG focussed on the commercial requirements, in which content providers and the end device industry clarify their commercial needs and requirements regarding HbbTV to their partners in the value-added chain. The discussion in the working group has shown that there are different points of view regarding the amount of freedom that should be present when using content and what those involved believe should and shouldn’t be allowed on the screen. This issue has now been dealt with in the new version of the white book; see the documentation pertaining to this particular WG focus.

The working group is currently working on the HbbTV signalling i.e. the way that TV channels work with the red button and the way data services in the end devices are activated. It has become clear that the quick introduction of this standard has meant that there is still room for harmonisation here.

The areas in which the WG is active will more focus on content in the future. This has resulted in further focuses, such as informing members, traders and consumers on all approaches of Smart TV. We also inform them on ways to use second screen, the measuring of range, data, consumer and content protection as well as payment methods.

As such, the work for the more than 30 representatives of the device industry, infrastructure operators, TV channels, universities and other institutions will go on. Because there’s one thing of which we’re absolutely sure: the Smart TV trend gives an important stimulus for market development, will change the way audiovisual services are consumed and enables new content, providers and business models to come onto the TV screen.

The development of the CE industry is taking place in faster and faster cycles – it is the market for Smart TV that is still in the middle of the pioneer phase. This white book therefore only represents an updated current snapshot of the market situation and the challenges and the requirements/needs of the market actors. As such, the German TV-Platform will continue to observe and accompany the market development. A third version of the white book is therefore already foreseeable for 2013. We would like to invite you to work alongside us!

The results of our working group from the last three years are collated in the second edition of the white book. The book is intended to give the reader a comprehensive overview of both the topics dealt with in the working group and of those that go beyond its direct sphere of influence. As such, the results are accompanied by data on the market situation, trend prognoses and a glossary.

Jürgen Sewczyk,
Leader of Smart TV WG and board member of the German TV-Platform
1. Overview of Internet & TV

1.1 Web TV, IPTV and Hybrid reception devices („Smart TV“)

From Latin roots, the word „Hybrid“ means, „blended, a cross between different species“; in other words, a combination of parts of various origins. Hybrid consumer electronics combine various transmission methods that were previously separated into one consumer electronics device. In this way, differing media content from various sources can be displayed on one TV screen. The basis of hybrid media services is the digitalisation of content and transmission technology that facilitates a combination of various standards from broadcasting and the computer world as well as new, convergent technologies.

Smart TV devices are understood to be television sets that can display broadcast programmes and services from traditional broadcasting channels as well as content from the Internet, so that both sources can be equally used as suppliers of information and/or entertainment. The technical requirements are offered by more and more TV devices with integrated digital receivers (iDTV), as well as digital receivers and Blu-ray devices.

Smart TV as a linkage between Web and TV on one device is another level of convergence between TV and Internet. In a first stage, moving images from the World Wide Web reached computer monitors either as openly-accessible Web TV, as (paid) video-on-demand services, or as real time online streaming. At the same time, IPTV services were offered similar to „classic“ broadcast services, but on the basis of the Internet protocol (IP), which reaches the monitor via managed broadband networks (usually upgraded telephone lines).

In the second stage of convergence, all device manufacturers are developing systems to make Internet services usable on TV screens, thus giving the user both an added diversity and a certain degree of interactivity on the TV set. There are also more and more TV broadcasters that are offering Hybrid-TV in the form of videotext / teletext as well as the „Mediathek“ hybrid libraries (catch-up video-on-demand services mainly offered by public broadcasters) – mostly in the HbbTV standard (hybrid broadcast broadband) (see chapt. 2.2). In addition, diverse online companies and other organisations offer online content for Smart TV devices. In Europe and worldwide, the German market is seen as a pioneer in the field of Smart TV. Apart from high-definition TV (HDTV) and stereoscopic three-dimensional TV (3DTV), interactive television has become one of the dominating trends in consumer electronics.

The imprecise use or even mixing-up of the terms IPTV, Web TV and Hybrid or Smart TV in the media often confuses consumers. These various services and types of audiovisual media delivery and use are simply put under the same umbrella as being „Internet-enabled“. In fact, a certain combination of Internet and TV is possible for all three, yet it takes place in entirely different ways.

**IPTV** denotes transmission of (mainly linear) broadcasting services via a managed broadband network. This means transmitting a signal encoded in Internet Protocol (IP) with broadcast programmes (TV and radio) via a special area within a broadband network (usually a telephone network) with guaranteed quality to a TV household. To display the transmitted content on a TV screen, an IPTV reception box from the provider is required, together with a service subscription. IPTV is in the process of establishing a fourth transmission method for linear TV in addition to cable, satellite and terrestrial antennas.
The term **Web TV** describes audiovisual media content that is distributed over the World Wide Web, whereby it is not transmitted with guaranteed quality and generally only displayed on PC monitors, laptops and tablet PCs or smart phones: i.e. not on large TV screens.

Originating from the consumers’ desire to time-independently use moving picture content from the Web and other popular online media also on TV screens, the CE industry developed Smart TV devices. These are hybrid TV devices (digital flatscreen TVs – iDTV, digital receivers and Blu-ray players/recorders) that can receive and display broadcast signals via cable, satellite or terrestrial antennas, as well as content and services from the Internet (incl. Web TV). The integrated browser uses a broadband network via Local Area Network (LAN) or Wireless LAN in order to display the content supplied via return channel exactly like TV programmes on the TV screen.

### 1.2 Consumer Electronics and Connectivity

Since early 2009, the first hybrid TVs have been available on the German market, that allow both broadcast reception as well as Internet connection and optimised display of Internet services on the TV screen. Initially, this was almost exclusive to digital flatscreen TVs (iDTV / Smart TVs). In the meantime, ever more providers of digital receivers or Blu-ray devices are relying on the hybrid approach. The advantage: with a smart receiver, almost any flatscreen TV with an HDMI connection can be upgraded to a hybrid device.

These SmartTVs also often provide the possibility to connect with other consumer electronics devices or the indoor environment. Thus digital cameras, MP3 players, home cinema, sound devices, DVD and Blu-ray devices and game consoles as well as modern mobile phones can be used on the TV screen. TV device manufacturers also offer solutions (in part) that permit control of the flatscreen via smartphones or tablet PCs – generally using apps. This enables the various devices to be connected together. The content exchange between the consumer electronics devices and those of the communications and IT world is made easier with special software. The content exchange between the consumer electronics devices and those of the communications and IT world is made easier with special software.

A new form of the TV-Web combination is the connection of TV with the various Social Web platforms that are becoming more and more popular such as Facebook, Twitter etc. This has led to this branch being called Social TV. Some device manufacturers have even developed special buttons on their TV remote controls for this. The connection of TV and Social Web can take place via apps in the manufacturer’s portals or even alongside the running program on the TV screen. The connection partially takes place using apps for smartphones, tablets and laptops as second screens; these can then be connected smartly via the TV screen (see also chapt. 3.3).

Some CE manufacturers even see their hybrid devices as the control centre of a complete household network that can monitor and control house and household technology. So far, the possibilities for connections within and between sectors that were previously separate, seems technically unlimited. Various developers are at least working on the adaptation of various technologies.

The demand for fast development of Smart TV has forced leading manufacturers of consumer electronics to cooperate with one another. At the start of July 2012, they founded the Smart TV Alliance in Los Angeles.
LG Electronics, the Philips subsidiary TP Vision and Toshiba are some of the initiators; all of them are members of the German TV Platform. They are also active in the Smart TV WG. Together, the companies wish to support a better infrastructure for TV applications and platforms so that Web services, on-demand services, games and music can be used on all flatscreen TVs and other TV sets through uniform specifications. The first step is an initial version of a Software Development Kit (SDK) for application developers that can be downloaded. It is based on open web technologies like HTML5 and enables applications to run on Smart TVs of the participating manufacturers platform-independently. The Smart TV Alliance is open to other device manufacturers, programme providers, content providers and infrastructure operators. At the same time, the alliance founders support the standard Hybrid broadcast broadband TV (HbbTV); it has its own organisation and is used by TV stations in Germany as well as in other countries.

However what will be decisive for the development of the whole market segment is what the users accept and what then succeeds in establishing itself in the market.
2. Types of interactive television

2.1 Overview of the various Hybrid TV Packages

Initially, it was several manufacturers of flatscreen TVs that drove the development of Hybrid-TV onwards since 2009. This resulted in flatscreen TVs with various hybrid options for the display of web content on the TV screen going onto the market in Germany. Some device manufacturers and content providers rely on variations of the Internet format HTML (Hyper Text Markup Language) for consumer electronics, which was known as CE-HTML. Others use IT solutions such as Java script for their Smart TV portals. Thus the manufacturers offer their services on the relevant TV flatscreens on the basis of company-specific formats to the viewers – mostly as an application (apps). For providers of services and content, this means that they each have to technically adapt their packages and come to an agreement with the respective device manufacturer about access to the portal.

Since 2009, a European consortium with the title HbbTV (Hybrid broadcast broadband Television) has been taking care of the harmonisation and further development of interactive television on Smart TV. Several members of the German TV-Platform such as the Institut für Rundfunktechnik (IRT), Philips and Astra have participated as active founding members. And since June 2010, the HbbTV specification has been recognised as a standard by the European organisation ETSI. More and more companies, including all the members of the German TV-Platform, support HbbTV technology (see chapt. 2.2.).

Despite several variations between HbbTV broadcast packages and manufacturer portals, there are important communalities. Apart from television reception via the classic broadcast infrastructures of satellite, cable and terrestrial, all Smart TV end devices support the use of services and content from the Internet and can use a return channel to provide genuine interactivity via the TV remote control. Here, the new hybrid devices in consumer electronics are certainly not intended to replace the computer, but to provide additional benefits and a new diversity to television sets. Ever more Smart TV devices even combine both: HbbTV functions with manufacturer-specific portals and multi-media networking.

2.2 HbbTV as a Standard: Origin, Application and Outlook

Why HbbTV?

Hybrid end devices do not represent a fully new concept. For years, there have been attempts by TV device manufacturers to also display Internet content on a TV screen via an integrated browser. But it is only now that Internet access is so widespread, offers high bandwidth and is cost-efficient with so many interesting media packages on the Internet, that critical mass for a wider market introduction has been reached.

Almost all device manufacturers have introduced Smart TV devices onto the market. For manufacturers, there is the necessity to differentiate themselves in the ever-more-competitive market for flatscreen TVs and the feature of „Internet access“ is used as a criterion here. On these devices, a „portal“ can generally be started, from which various Internet packages can be accessed and of particular interest here are moving picture contents such as YouTube or the Mediathek services of the German ARD and ZDF stations. The concepts followed by the device industry so far have however caused various questions to arise.
The resolution of modern HD displays would permit any content from the Internet to be displayed and navigated. Nevertheless, the requirement to show content on a TV in the same way as on a PC seems questionable for several reasons. The relative viewing distance is generally greater with a television than with a PC, which is why most Internet packages in the domestic TV environment are displayed too small and seem to be poorly legible. Internet content is optimised for navigation with a mouse cursor and keyboard and both input features seem to be poorly compatible with common TV usage. It is here that the classic remote control with cursor, key and colour buttons is still dominant.

Commercial reasons speak against including hardware inside a TV screen or set-top box in order to deliver a full scope of services to match the flexibility of a present-day multimedia PC. Thus generally Internet services are only available in a limited form for the current Hybrid-TVs or they have to be specially processed for display on the TV screen. This means that two problems arise from the viewpoint of the service providers:

1. Each manufacturer of hybrid devices uses a different browser and supports varying streaming formats and protocols. This leads to the problem of needing to adapt content individually for various manufacturers and the heterogeneity represents a great hindrance for a dynamic service market.

2. In the case of hybrid devices, although they are using the same screen, the „worlds“ of Internet and that of television are in fact separated. Switching between both areas is performed by means of buttons on the remote control and there is no referencing from the current programme in the Internet. This means losing substantial potential in the shape of the new-style content that can be referenced from both „worlds“.

Anfang 2009 haben sich daher verschiedene Markt partner (ANT, APS, IRT, OpenTV, Philips und das französische HD-Forum, später auch Samsung und Sony) zusammengefunden, um ein einheitliches technisches Szenario zu entwickeln, das auf Grundlage von HTML als Basistechnologie die intelligente Verknüpfung von universellen Funktionen und Inhalten aus dem Internet mit denen des TV-Gerätes erlaubt. Zielstellungen für das zu entwickelnde Hybridsystem waren:

For this reason, various market partners (ANT, APS, IRT, Open TV, Philips and the French HD Forum, as well as later Samsung and Sony) got together to develop a uniform technical scenario that would allow the intelligent connection of universal functions and content from the Internet with that of the TV device using HTML as the basic technology. The objectives for the hybrid system to be developed were:

• It was to be open and standardised in order to permit efficient development of content independent of single manufacturers or platform operators.

• It was to be based upon open standardised technologies as far as possible.

• It should only specify the minimal required components and functionalities, so that the specification could be supported by as many market players as possible.

• It should allow the combination of all broadcasting systems (satellite, cable, terrestrial) with all Internet access technology (DSL, cable, wireless).
• It should permit connection between linear television content and additional interactive services.

• It should also permit the use of the broadcasting channels for the distribution of additional services.

• It should be suitable as a successor to the present-day teletext system.

• It should not influence the integrity of broadcast programmes, i.e. not combine services from the Internet with the screen image in an uncontrolled way. This means that in future, accompanying HTML pages would be able to be started directly from a TV programme. This also represents visibly better display options for teletext in the age of HD. Additional information, such as news tickers, can be laid transparently across the TV image and relevant information to the TV programme can be concurrently displayed, for example with quiz shows. But new functionalities also result in the HTML environment:

• A smaller TV picture can be integrated into HTML pages so that directly switching to another TV programme from this page is possible.

• A substantial reason for using HTML is also the simple porting of services that are already developed for the Internet. In this way, attractive services can be brought to market quickly not just by the broadcast institutions, as is shown by the host of Internet services on hybrid television receivers now on the market.

The objective of developing a standard in accordance with the aforementioned general conditions was reached when the specification was submitted to ETSI at the end of 2009 and published in June 2010 as ETSI TS 102 796.

**Technical Concept of HbbTV**

The HbbTV standard defines new technical elements as little as possible, but rather reverts to existing technical standards. In that respect, the specification is more a profile of what exists, rather than a new technological approach. This approach thus contributes vastly towards a quick implementation on devices. Essentially, HbbTV is mainly based upon the following three standards:

The CE-HTML standard, that is currently available as a 2007 version, is based on W3C Internet standards and specifies an HTML profile for CE devices. This browser profile also represents the technical foundation of HbbTV. It is based on XHTML 1.0, DOM 2, CSS TV profiles 1.0 as well as ECMAScript-262 (JavaScript™) and is optimised for the display on CE devices – i.e. generally TV screens – of corresponding HTML/Javascript pages that fulfil Web standards as far as possible. It should be stated in particular that the XMLHttpRequest object is supported, so that application developers are given the opportunity to develop HTML applications that are comparable with current so-called Web 2.0 applications. This compatibility makes it possible for existing know-how, technology and experience deployed for contemporary web applications to be seamlessly used on HbbTV set-top boxes while concentrating on the aspects of broadcast integration. Furthermore, the key codes for the most popular TV remote controls for example, are also included here.

CE-HTML does not, however, contain any elements that specify the connection to a DVB environment, as is the case with digital television.
This is fulfilled by the browser specification of the Open IPTV Forum, published in January 2009. While this specification was written for the application in IPTV networks, it contains APIs that can also be used for hybrid decoders. These variously include functions for integrating the TV image in HTML applications, for changing the radio or TV programme, for pre-programming recording and for access to DVB data. With the elements of both these specifications selected for HbbTV, the fundamental browser functions are defined.

Three important additional functions are provided by the DVB standard „Signalling and carriage of interactive applications and services in hybrid broadcast/broadband environments“, that was completed in March 2009 and is available as ETSI standard TS 102 809. The DVB standard first controls how applications that are started from a TV or radio programme are signalled in the DVB-multiplexes. In line with the previous MHP standards this is performed via the Application Information Table (AIT), listed in the Program Map Table (PMT) of the respective program. The AIT of any program lists all applications that may run together with this program. Other applications may switch to this program but are stopped by the system then. In this way it is ensured that the program is not „hijacked“ by external applications and for example overlayed by external advertising.

One of the applications that is assigned to a program can be denoted in the AIT as a so-called „autostart application“. This application runs automatically when a change is made to the respective broadcast programme and usually displays a red button on the screen that then disappears after a brief period. This symbol is to indicate to the viewer that he can start an additional application by pressing the red button on the TV remote control. A further signalling option in the AIT is for applications that are designed to take over the present-day teletext service. This signalling can be connected to the teletext button by the device manufacturer so that a new teletext application can be started directly.

In addition to applications that are linked to a broadcast service via AIT signalling (broadcast-related applications), HbbTV also supports application that are not necessarily linked to a broadcast service (broadcast-independent applications). These can, for example, be programme guides from third parties or applications such as Flickr, YouTube or similar. HbbTV allows the change from broadcast-related to broadcast-independent applications, but limits access by broadcast-independent applications to broadcast content.

Furthermore, TS 102 809 specifies the transmission of applications via the DVB broadcast channel. This option is interesting in the case of devices that have a browser, but are not connected to the Internet by the viewer. While the volume of data that can be transmitted via the broadcast channel is limited, it is adequate for simple services such as improved teletext.

For transmission of the HTML applications, according to the BlueBook, the DSM-CC standard applies, which was also used by MHP.

The „stream events“ with which small data packets can be transmitted concurrently to the TV programme in the broadcast channel are also part of the DSM-CC standard. With this, for example, questions or answers can be transmitted at the right time during interactive quiz shows. Time synchronisation of the broadcast content and interactive responses via an Internet connection would only be possible with difficulty and the webservers would also be subject to a load of millions of concurrent connections. Using the broadcast channel is considerably more efficient for such applications.
In total, the HbbTV Browser profile represents a pragmatic compromise, that offers a flexible and universally-useable technical infrastructure for various service options on the one hand, while on the other hand can be implemented in hardware environments that are considerably less powerful in the IDT (Integrated Digital TV)/STB environment by comparison with the PCs that are generally used on the Internet today. A browser that complies with the HbbTV specification can be integrated into any end device as an independent component. Providers of complete middleware solutions can, however, also market this browser as an integral part of their product. Depending upon the requirements of individual markets, this browser concept can also be combined in the end devices with API systems that have already been introduced (such as MHP or MHEG).

The HbbTV Consortium today
As already mentioned, the „HbbTV“ initiative initially consisted of loose cooperation between the companies ANT, APS, France Televisions, IRT, OpenTV, Philips and TF1, as well as Sony and Samsung from August 2009. At this time, the HbbTV partners announced the new initiative by means of a press release and established the possibility for further companies to participate as „supporters“ and over 100 companies and institutions made use of this.

In April 2010, Philips, ANT, Sony, Samsung, OpenTV, SES Astra, IRT, TF1, EBU and France Televisions signed a consortium charter to regulate further cooperation, amongst others with the objective of opening up HbbTV to further members. In the meantime, this consortium is a legal entity as a company registered in Switzerland. Over 60 companies have already joined as members. The further technical activities are being driven on by a series of working groups. These activities are primarily:

- a review of the first version of the HbbTV standard to correct errors or unclear points as well as the integration of some new features such as adaptive streaming. A new version of the HbbTV standards was submitted to ETSI in August 2012.

- The development of a test suite for testing with HbbTV devices. This test suite is intended to ensure a uniform and consistent implementation of HbbTV in all devices and reduce the expense of tests for devices. An initial version of this test suite is finished and is available

- The development of a new version of the standard is being planned; this will boast a range of new features, one of which is support for HTML5

- Discussion forums and workshops, in the course of which implementation questions and error possibilities on the basis of previous practical experience will be discussed and know-how in all aspects of HbbTV built up.

Status of Market Development: HbbTV Services in Germany
Since IFA 2010, all four major German FreeTV provider groups ARD, ZDF, RTL and ProSiebenSat1 offer HbbTV services. The public broadcasters focus to the so-called „Mediathek“ services provided by ARD, ZDF, arte, „Das Erste“, rbb, Radio Bremen and the Tagesschau, as well as various teletext packages and an EPG. In the case of private providers, vivid and multi-media processed teletext variations with photos, video clips and interactive advertising stand to the fore; ProSieben already offers games and „voting“ to some extent. An excellent
example of the efficiency of HbbTV became visible during the Olympic Games, as ARD and ZDF integrated six live streams into a single HbbTV Olympia app. But also smaller broadcasters see HbbTV as a valuable extension feature to their programme activities. Thus in the meantime, Sport1, HSE24, Dr.DishTV, BibelTV and AstroTV are offering HbbTV packages. There are already applications in operation with which transactions such as booking or purchases can be carried out. There is no doubt that such applications will also be offered by many providers in future.

Status of Market Development: HbbTV Devices
At the end of 2009, the Humax iCord HD came onto the market as the first HbbTV set-top box for satellite reception. In the course of 2010, further manufacturers of DVB-S set-top boxes followed with VideoWeb, Smart and Invero. At the IFA 2010, more major manufacturers such as Philips, LG, Toshiba, Loewe, Technisat and others followed, particularly with integrated TV reception devices (iDTV) that supported HbbTV. In the meantime, practically all device manufacturers of note have HbbTV-enabled devices on the market already (at the moment some 30). Due to this comprehensive support of HbbTV by the device industry, a large proportion of the newly-sold television devices is already equipped with HbbTV. This shows that this system is becoming increasingly present in German households.

HbbTV by Various Communication Channels
HbbTV is a standard that can be very generically applied to all combinations of broadcasting networks and Internet access – i.e. also via DVB-T and mobile Internet. Here is a brief overview of the status of HbbTV in the various German DVB distribution networks:

DVB-S: Like many other new developments in digital television – the earliest market segment. All the aforementioned HbbTV services are available via satellite and most HbbTV devices available on the market exclusively support satellite reception.

DVB-T: At the Medientage München congress in October 2010, ARD, ZDF and ProSiebenSat1 switched HbbTV signalling onto their terrestrial multiplexes and showed here their HbbTV packages on HbbTV prototype devices or with a DVB-T frontend. Virtually all of the HbbTV iDTVs from the major manufacturers that came to market in 2011 also support DVB-T reception.

DVB-C: In cable, the HbbTV signalling for all programmes is available already in all networks. Here, it is the same as with terrestrial: HbbTV iDTVs from major manufacturers are generally also equipped with DVB-C tuners. Because of CI Plus, they can be used in all major networks.

HbbTV can even be an issue for IPTV networks: the hybrid standard can be deployed here in the same way as in conventional DVB networks and in this segment, too, some IPTV providers have already started working on their HbbTV decoders. In this way, the “green light” has been given to permit HbbTV to become a universal standard for hybrid television across Germany.
Status of HbbTV in Europe and Worldwide

In respect of the market introduction of HbbTV, Germany has an internationally pioneering role with a total of 44 current programmes. The French market had already played an important role in the development of the HbbTV standard; it is being used there by TF1, France TV and Canal+ HbbTV. Wide introduction is planned with coordination by the French „HD-Forum“. Regarding HbbTV, Spain is also very active: Mediaset España (with channels Tele5 and Cuatro) has carried out HbbTV tests via the Telefonica network. VeoTV has already started the HbbTV service „Mundo Interactivo“ and Telecinco is already offering HbbTV services. The public provider RTVE supports HbbTV also.

HbbTV services are already in operation in the Netherlands and in the Czech Republic. Tests are being carried out in further European countries like Austria, Norway, Sweden, Denmark, Belgium, Switzerland, Poland and Finland. Services are planned to start in 2012.

Even in England, where broadcasters generally rely upon the „YouView“ platform that was specially defined for the English market but has not yet been started, the „Freesat“ platform has decided upon the integration of HbbTV in the meantime. Only in Italy, the MHP standard that is already in use will provisionally be adhered to and complemented for hybrid use.

A total of 20 EBU members have announced HbbTV operation for 2012 and in Asia, 10 broadcasters have chosen HbbTV as a service for DVB-T. Various discussions with international partners have indicated that HbbTV is also arousing interest outside Europe and it would not be for the first time that European digital TV standards also enjoy international success.

2.3 Display and Use of Web Services on Smart TV

Originating from the consumers’ desire to concurrently use moving picture content from the Web and other popular online media on TV screens, the CE industry developed hybrid devices that allow both Internet content and apps to be used on the TV set. On the other hand, TV programme providers developed the HbbTV standard together with technology firms and other institutions. This standard allows linear TV programmes to be linked with selected Internet contents. Initially, it was primarily hybrid flatscreen TVs (iDTV) that were equipped with the hybrid function. In the meantime, there is a variety of devices on this market. Apart from flatscreen TVs, these are digital receivers and Blu-ray devices, that can receive and display broadcast signals via cable, satellite or terrestrial antenna, as well as content and services from the Internet (including Web TV). Nowadays, these devices are increasingly implementing the HbbTV standard.

Often providers and manufacturers of hybrid end devices do not limit themselves to provide the hardware, but also offer portals as an entrance into the diverse world of Web TV or further services that are not confined to TV.

The manufacturers’ Smart TV portals vary in design and in operation structure on the one hand and on the other hand in terms of content. Generally, the various manufacturers’ portals offer services such as news, weather, games and social networks as well as video-on-demand services and Mediathek services (catch-up services). The majority of the services available can be found on the various portals of different device manufacturers, for example „YouTube“, „Bild.de“ (popular German electronic newspaper services) or the „Mediathek“ services run
by the TV broadcasters. Among the manufacturer portals on which the services are often displayed as tiles in a gallery similar to the well-known „apps“ from a smartphone environment, the user can access the service required by means of the remote control.

It is possible that – depending upon the service – there are access prerequisites such as registration or payment. Other services are free of charge and immediately usable. Some of the portals discussed are assembled by the device manufacturers, others are operated by an external service provider.

Portals are offered both by TV manufacturers as well as by manufacturers of digital receivers or Blu-ray players. They are also offered by the infrastructure operators Astra, Eutelsat and from 2012, they will also be offered by Media Broadcast. For Astra and Eutelsat, the portals can be used by end device manufacturers as a white-label product. Media Broadcast wishes to expand the limited DVB-T program capacity by using the hybrid approach. The scope of the services offered in the portal varies by manufacturer. As a rule it can be said that the manufacturer who has started early with the development of hybrid devices also makes a larger selection of content available. In general, portals offer users the possibility of sorting services according to their preferences, to generate ‘bookmark lists’ and to independently search beyond the selection of widgets („apps“) on display among a type of „App gallery“ and save these on the portal.

The services that can be reached via the portal can include the following types:

- Services with a direct reference to the broadcasting programme, for example the Mediatheken – the catch-up services of broadcasters, in which all sorts of missed programmes can be watched, or a direct connection to a specific public appeal programme can be established („Tagesschau“ – news in Das Erste).

- Services with an indirect connection to the broadcast programme, like e.g. the web portals of TV broadcaster groups or their commercial video on-demand portal, from where TV programmes can be exclusively downloaded in advance.

- Services that have no relevance to the broadcasting services, but contain audiovisual media services, such as user-generated content like „YouTube“.

- Services that neither have relevance to the broadcasting services nor to the moving image content, like e.g. electronic newspapers, social networks, online photo galleries, games portals, auction platforms or telecommunications services.

- Shopping offers of all large TV shop providers, partially with ordering function on television.

Regarding the variety of content and services that are available via a portal, the development is still in the early days. Some portals additionally offer free Internet access via an open browser. With these devices the user can, for example, enter a random URL and go to any website desired via their TV device. An advantage of pre-sorted services is to have the security regarding their optimal display and functionality on screen, as well as legal security by means of exclusion of illegal content, guarantee of youth protection and copyright protection.
Another way to access more content and service than the TV programme via a hybrid device is to access the packages of the TV broadcasters themselves. In this process, it is practically only the HbbTV standard that gets used. It connects the TV signal of a broadcaster with its content from the Internet. In this way, HbbTV allows a new interactive TV experience. On HbbTV-enabled devices, HTML pages are generally opened and closed by the red button; this is one of the coloured buttons of the TV remote control. In this way, any applications defined by the broadcaster as relevant to the current programme, can be realised. In compliance with the HbbTV standard, the TV broadcaster has control in respect of linking from the current programme and can – depending upon the programme – lead the viewer to various websites. These can, for instance be relevant to certain topics and can be in direct connection with the currently watched TV programme, or link to a high-definition video text in modern presentation and a comprehensive programme guide. Links to the navigation portals of the TV broadcaster or their company website are also feasible. With HbbTV, interactive involvement of the viewer is possible, for example online-voting in live programmes or home shopping without media interruption. With the Mediathek services, films can be directly consumed via the Internet – depending upon the business model, registration or payment can be required for this.

It is in the nature of things that the link from the current programme can only be provided by the TV broadcasters that are received by the broadcast transmission method available in the household. Technically, the link is transported via the EIT information in the broadcast signal. Infrastructure operators of broadcast services such as cable network operators, satellite operators and providers of terrestrial broadcasting networks offer access to web services usually in the form of portals that are similar in principle to those of the end device industry. Here, too, the graphic display, the scope of the package and the diversity of the services differ and many portals are still at the set up stage.

2.4 Business Models and Advertising Types with Smart TV

The number of hybrid end devices in Germany is growing at a fast rate. All relevant device manufacturers have stated that their hybrid devices will offer series HbbTV support by the autumn of 2011 at the latest. The major groups of TV broadcasters, and also a growing number of smaller broadcasters, have developed and launched HbbTV applications already. At the same time, the information and entertainment offerings that TV viewers can access in the portals of their TV device manufacturers (so-called TV apps) are growing. Most market players assume that the combination of linear broadcasting reception and the Internet-based transmission of content will decisively characterise the TV market in coming years. After PC, smartphone and tablet computers, television will become a further highly attractive sales channel for new types of advertising and e-commerce or rather ‘TV-commerce’.

Video Advertising

Whilst the HbbTV packages from the public broadcaster groups do not follow commercial interests but are rather intended to be a method of combining expanded teletext, EPG (Electronic Programme Guide) and free access to the partially very comprehensive Mediathek (video-on-demand) services, the marketers of private broadcasting stations see HbbTV more and more as a possibility for new advertising formats. Apart from the well-known display ad formats from the online sector, video ads are increasingly being used in the shape of pre-rolls. For the providers of commercial TV apps in the manufacturers’ portals, revenues in particular from video advertising are the substantial basis for refinancing today.
According to calculations by Goldmedia, the net advertising turnover for online video advertising will increase from 80 mill. EUR today to approx. 350 mill. EUR in 2015. The proportion that can be attributed to Hybrid-TV is still relatively small, but according to the moving image marketer smartclip, providers of high-reach TV apps will be able to generate annual advertising revenues in the lower to middle six figure area with an increasing tendency, since the number and reach of apps increases, as does their quality.

**TV-Commerce**

On the other hand, paid content, i.e. the offer of subscriber services, is hardly playing a role yet as a business model in the case of Hybrid-TV. While all major German TV device manufacturers have at least one video-on-demand service in their app-TV portals, the actual number of videos watched is still marginal.

According to a current study by the Munich consultancy company Mücke, Sturm & Company, a more intensive usage of available packages – also in this country – as well as further transaction-based business models in Smart TV (home shopping, direct response TV, competitions, games, call-to-action campaigns etc.) can only be realised when processes for customer-friendly and secure purchases have established themselves on the market. It is only when these exist that a part of the purchases made today via traditional television will migrate to Smart TV. Apart from that, new players will come from the Internet that will use television as an additional sales channel, such as e.g. operators of e-commerce sites or shopping portals. In accordance with this study, goods worth over 1.8 bn. EUR will be sold in this way in five years’ time.

It should, however, be noted that the user scenario is different with television compared with PC and smartphone. The viewer uses TV offers in a „lean-back situation“ and is not using a keyboard, but rather a remote control that is fitted with few keys. But in order to successfully establish the previously mentioned business models, a clear identification of the television viewer is necessary. On the Internet, this is generally performed by authentication of the user with the combination of user name and password.

With an increasing number of content or service packages that require registration and/or payment both on manufacturers’ portals as well with broadcasters, the necessity arises for a central authentication or single sign-on system (SSO) that conforms to television as a payment system for sellers and customers. The example of iTunes shows of what significance this can be for commercial success from the viewpoint of content providers, and the study by Mücke, Sturm & Company also confirms: „Entering user data and payment information is far and away the conversion killer par excellence for every sale via remote control.”

In that respect, the announcements by several device manufacturers that they will be introducing their own authentication and payment systems are a basic step in the right direction, as they are designed to increase usability for customers, thus reducing inhibitions to purchase. Unlike in the case of the smartphone, no manufacturer so far has a dominant market position, so that content and service providers are forced to provide their offerings to as many manufacturers as possible. Adaptation of the service to the respective manufacturer’s authentication and payment system (if at all available), provides sellers with complex adaptation and administration processes that block rapid market penetration.

One possibility is therefore to introduce special payment systems that are tailored to the HbbTV standard, since one of the decisive properties of the standard is that it combines the most varied CE devices (televisions, satel-
lite receivers, Blu-ray players), so that services can be displayed uniformly independently of device manufacturer and type. One example of this is the TV-ID service offered by the company teveo interactive. Similar to Facebook-Connect on the Internet, it offers customers on interactive television the chance to register with all connected services, irrespective of which device the customer is using the service on. In addition, the customer can also use paid content that is then billed via the TV-ID on behalf of the provider. For service providers, this means that they can use the same system on all devices with the same procedures, without having to adapt their services to each device. Another example is offered by Ping 24/7, which presented its solution for TV-commerce to the German TV-Platform in April 2011 on a Smart TV (see chapt. 3.4).

New Types of Advertising

As soon as there is adequate penetration in the smart CE device market, new forms of advertising will develop from the possibilities of directly addressing the customer on television, where interactivity and close proximity to the purchasing decision are at the foreground. One possibility would be to personalise classic TV spots. For this, TV broadcasters or advertisers would be provided anonymous profile data of viewers in realtime, whereby they would then be in the position of adding closely-targeted content and linking their spots to a specially-prepared website in order e.g. to encourage viewers to participate or to stimulate impulse purchasing.

This direct contact to customers via television is also not limited to TV spots, it is equally possible that the broadcaster fades in a personalised display that is linked to the current programme. Advertising will profit from the emotional framework that is provided by the linear television programme, and in this way clearly increases the likelihood of customer reaction. This option goes far beyond the potential of purchasing within TV apps on manufacturers’ portals, but sets high requirements on the simplicity of the checkout process (e.g. limiting entry of a central PIN to all transactions) at the same time as maintaining legal data protection provisions. As soon as these new advertising formats have established themselves on the market, the TV advertising market will clearly expand.
2.5 Over the Top („OTT“) – TV: Important National / International Players

The term Over the top (OTT) refers to the online transfer of video and audio content. The transfer may even take place without the Internet service provider controlling the OTT offer itself. No registration is usually needed to access the content on the platform in question. The Internet service provider has knowledge of the transferred IP packages, but it is not responsible for the copyrights, the use of the materials and any further transfer of the contents. The transfer takes place independently of the Internet bandwidth – as a result of this, the technical quality cannot be guaranteed. The users can receive OTT content via online-enabled devices such as PCs, laptops, tablet PCs, Smart TV screens, set top boxes and games consoles. Access is mostly enabled via an IP address check and can therefore be made allowed specifically for each country if this is desired. OTT is not broadcast, DVD or PVR.

OTT TV refers to television sets receiving programme content from the Internet. Even peripheral devices such as Blu-ray players/recorders or games consoles can receive content from the Internet via a LAN or WiFi connection; this content is then sent on to the TV set. This content is often specially prepared for the TV set so that simple navigation via TV remote control is possible.

As OTT providers are generally individual companies, it is difficult to bring about a standardisation of the end devices incl. operating system software. Each operator is tempted to promote their own proprietary solutions on the market to try to force competing companies off the market. OTT TV is a software-based approach. As such, the service provider needs to work together with the device manufacturers of Blu-ray players, set top boxes, television devices and games consoles; after all, it is these manufacturers that make the software available for their devices.

Google TV

In May 2010 Google presented its Android-based TV platform. With Google TV, Google is one of the largest representatives of OTT-TV and typically wants to transmit all services that the Internet offers to television devices, concurrently to the classic broadcast programmes. Users can seamlessly combine linear and non-linear moving images on their televisions. The platform offers a search function which is similar to the one used by mobile end devices that use Android technology. In this way, a simple and quick search can be made for anything without great use of resources. Apart from that, Google offers functions similar to those of other Smart TV providers. This includes the feature of personalisation, so that every viewer can create their own start page and get individual suggestions from the Net. Google also offers picture-in-picture mode, where web content and television are displayed at the same time and provides bookmarks organisation in order to individually save favourite TV programmes and web pages. Google TV relies on the Android operating system and the Google Chrome browser. In order to also see all moving images in the Net – especially videos and animations – a complete Flash plug-in is integrated within Chrome. Furthermore, Google is working together with some hardware partners in the CE industry of note. Google TV is starting in Europe with special Sony devices; these Google TV devices will be available in Germany from Autumn 2012 onwards.
Skype goes TV
The Voice-over-IP software with instant messaging function: Thanks to OTT-TV, Skype has also found its way to television devices. In this way, news and calls can be enjoyed directly in the living room on the big screen. Skype is integrated by Oregan Networks into various TV devices. The Oregan media browser is an embedded software for Internet and IPTV services. CE device manufacturers such as LG, Panasonic and Samsung supply the additionally required system prerequisites: Skype compatible televisions and Freetalk TV cameras with special microphone system.

Yahoo! finds its way onto TV
Yahoo! brings a platform for Internet television into many LCD television devices, digital set-top boxes and other forms of consumer electronics. Together with the device manufacturers Vizio, Samsung, Sony and Toshiba, Yahoo! has announced that its Connected TV will reach television viewers in over 40 countries in Europe. With new web-based development interfaces, third-party providers can create widgets and TV apps with the Yahoo! TV Widget Development Kit (WDK) – the new WDK version has been available for free since May 2012. Use of Yahoo! Widgets does not under any circumstances preclude the use of the HbbTV standard. Vestel, for example, has decided to integrate both options into its devices and leave the choice to the user. The added value of Yahoo Connected TV by comparison with classic television comes from tens of thousands of films and TV-Shows that can be viewed (VoD) and Internet content such as games, social networks, web video or shopping expeditions through the virtual world.

Apple TV is primarily for iTunes content
With Apple TV, Apple is following another concept to Google or Yahoo!. With Apple it is not a case of access to the free Internet and therefore no competition to Google or Yahoo!. Apple presented the 2nd generation of its Apple TV on 1 September 2010 and the 3rd generation on 7 March 2012: a device to play iTunes content such as music, podcasts, videos, movies and your own photo collection. The small streaming box is connected to the television or a screen and permits access to media content that is fed in from a local network or is saved on the internal hard disc. This means the synchronisation of PC and Apple TV via AirPlay. A further five computers can also transmit streaming data to the Apple TV, although these data can no longer be saved. The device is visually very simple and also features various connections and interfaces (HDMI, optical audio connection, Ethernet, integrated IR receiver, micro USB for service/support) and except for the remote control, it has no buttons. A training program is albeit integrated, so that various remote controls such as iPhone or iPad can control the complete home cinema. As mentioned at the beginning, the Apple TV has no TV receiver, which is why only content from the iTunes library can be played – this has recently become possible in HD 1080p. Services like YouTube, Flickr, Vimeo and WSJ live (Wall Street Journal videos) can now be accessed, as can some subscription services like MLB.tv. There has previously only been speculation regarding a device made entirely by Apple.
3. Results of Hybrid End Devices / Smart TV WG

As one of its first tasks, the Smart TV WG (former Hybrid End Devices WG) took on the formulation of commercial requirements in 2009. Defining the following commercial requirements stretched over several months and was accompanied by lively discussion. In order to remain as close as possible to market development, the requirements referenced existing specifications and standards to as close a degree as possible, including the HbbTV specification. Taking into account the international significance of Hybrid- TV, these commercial requirements were worded in English from the beginning.

3.1 Commercial Requirements

The following table lists the main Commercial Requirements for Hybrid Broadcast Broadband TV devices which are regarded the as the basis for the WG Hybrid End Devices of the German TV-Platform. They are compared to modules of a technical concept for such devices.

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Commercial Requirement</th>
<th>Realisation in HbbTV Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Technology must be based as far as possible on open standards and allow easy realisation of applications</td>
<td>State of the art browser technology: XHTML 1.0, ECMAScript-262, DOM 2, CSS TV Profile 1.0 (CEA-2014-A / Kap. 5.4)</td>
</tr>
<tr>
<td>2</td>
<td>Access to and control of broadcasting service related (bound) applications shall be easily possible for the user</td>
<td>The „Red-Button“ functionalities and the application lifecycle function in HbbTV cover this requirement</td>
</tr>
<tr>
<td>3</td>
<td>Access to and control of non broadcasting related service (unbound) applications shall be easily possible for the user</td>
<td>HbbTV does not mandate any easy access mechanism to unbound applications and does not prohibit a device manufacturer to implement the system in way that he is a gatekeeper for unbound applications in „HbbTV Implementation Guidelines“ the implementation of an easy URL entry (soft-keyboard or selection from a list of all available apps) and the possibility of permanent storage of favourite apps should be mandated</td>
</tr>
<tr>
<td>4</td>
<td>The system shall allow the implementation of application platforms, where the system features, including application access and control functions, for both bound and unbound applications are well balanced, especially also from a customer usability and convenience perspective</td>
<td>See 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Starting and stopping of applications (including teletext replacement) triggered by DVB services must be possible</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Signalling based on DVB BlueBook A137, detail clarification by HbbTV profile</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Applications must be able to trigger a service change</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A service change can always be triggered by the application (OITF-DAE / Kap. 7.4). If the application is not signalled on the new service, it will be terminated.</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>For users it shall be easily possible to terminate a running application</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The concept of HbbTV is to avoid killing an application in the technical sense (this could be done via an EXIT key which is optional for the RCU) but to allow launching and hiding applications using the red button. This is part of the application guidelines.</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>The Transmission of applications via the broadcast channel must be possible</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Usage of DSM-CC object carousel according to DVB BlueBook A 137 (future ETSI TS 102 809) is possible for application transmission. DVB-SI has to be extended to allow the signalling of pure HbbTV data services.</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Secure data exchange shall be possible</td>
<td></td>
</tr>
<tr>
<td></td>
<td>covered by HbbTV-Specifications (https server certificates)</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>The inclusion of one TV signal in the applications must be possible (picture in graphic). Some broadcasters have the requirement to control PiG in their applications exclusively.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OITF-DAE / Kap. 7.7</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Applications must be able to use resident storage</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OITF-DAE / Kap. 9.1 minimum 100 Cookies; each 4 kByte</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Access to EIT data (EIT present/ following and EIT schedule actual and other) must be possible by applications</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OITF-DAE / Kap. 7.9 HbbTV profile: restriction to EIT p/f (complete EPG data can be transmitted via IP) EIT schedule is optional</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Synchronisation of interactive content and broadcasting services must be possible</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1) Polling is possible 2) AJAX according to CEA-2014-A / Kap. 5.5.2 3) DSM-CC stream events (DVB BlueBook A137)</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Individual programming of PVRs by customers should be possible via trusted applications</td>
<td></td>
</tr>
<tr>
<td></td>
<td>HbbTV Annex A1: PVR API only for „trusted applications“ (triggered by manufacturer or broadcaster) – HbbTV Kap. 10.1.2: applications could read signs only from applications of the same domain. Manufacturer can create further dialogs (10.2.3.3)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>Reference/Option</td>
</tr>
<tr>
<td>---</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>15</td>
<td>Transmission of still pictures must be possible using state of the art encoding GIF, JPEG, PNG</td>
<td>(CEA-2014-A / Kap. 5.4)</td>
</tr>
</tbody>
</table>
| 16 | Streaming formats and protocols must comply to the state of the art  
   - unauthorised download of streamed content shall not be possible                                                                                                                                                                                                                             | HbbTV Profile (Minimum)  
   Protocols: http (https), RTSP  
   Container: MPEG2-TS/MP4  
   Encoding: H.264, HE-AAC  
   - a full DRM system can be integrated (optionally)                                                                                                                             |                                                                                                       |
| 17 | There must be a defined common set of input keys for application control (red button, colour buttons, number buttons 0-9, P+, P-)                                                                                           | basis: CEA-2014-A / Kap. 5.4.1  
   details: HbbTV Kap. 10.2.2                                                                                                                                                    |                                                                                                       |
| 18 | Entry of short text (words) into HTML-pages must be possible                                                                                                                                                                                                                                          | HbbTV profile mandates manufacturer specific solution                                                                                                           |                                                                                                       |
| 19 | It shall be possible for EPG-applications (bound or unbound) to tune to a service selected by the customer. Furthermore it shall be possible for an EPG-application (bound or unbound) with the permission of the content provider to present a preview of a service as a downscaled live video at any time, without termination of the EPG application | HbbTV-Standard: only if the broadcaster allows the EPG-Application                                                                                                 |                                                                                                       |
| 20 | Applications must be able to tune to a service or select a (VOD) event delivered via both the broadcasting transmission path (DVB) or the Ethernet path (IP)  
   This shall not be restricted to services provided by the channel list (tuning by frequency), but also cover e.g. VOD services via DVB or IP                                                                                         | Streaming video via IP is specified in section 7.3. of the HbbTV specification plus the referenced standards. Section 6.2.2.2 of the HbbTV spec. clarifies that tuning can also be done to VoD channels which have no SDT entry. |
| 21 | Applications (bound or unbound) shall be able to access to DSM-CC-carousel data. This would allow especially also applications for CPEs without or not yet activated return channel capabilities.                                                                                             | Section 8.2.2 of the HbbTV specification states that for accessing the content of a DSM-CC carousel file, the XMLHttpRequest object can be used. |
3.2 Content Guidelines

Hybrid devices and the associated changes in use of media provide a whole range of challenges for the sector. Hybrid reception devices have the potential of making a lasting change in the user behaviour of TV viewers who are more and more becoming active media users and are in the position of putting together their media programme from various sources. Players from the „classic“ broadcasting sector see themselves as being confronted with competition „from the Net“. The interplay of media fusing various methods of transmission on the TV screen has not yet been clearly solved. The until now valid regulation, such as the European Audiovisual Directive implemented into German law as the 13th Rundfunkänderungsstaatsvertrag („Amended Interstate Broadcasting Treaty“) states a differentiation between linear on one hand and non-linear services on the other hand, for each of which there is a different degree of regulation.

What is however not clear in view of the new technical possibilities of Smart TV is which rules apply to the interaction between linear broadcasting and online services. The new generation of TV devices also raises questions in the areas of copyright law and youth media protection. As part of the German TV-Platform, the Smart TV WG has been moderating discussions between publicly-funded / commercial TV providers and the consumer electronics industry. Generally, the requirements that the TV stations have of hybrid end devices has been discussed and, specifically, the requirements that they have of HbbTV devices. The discussions focussed on the treatment of audiovisual content.

The aim of the discussions was to approach the partners’ ideas of the value-added chain and the best possible framework conditions for the introduction of services and devices. These discussions have sharpened both the sensitivity and the understanding that the relevant market players have of each other. Thus far, the moderation of the TV-Platform had a considerable effect on positive market development.

At the current point in time (summer 2012) we can determine that the largest currently possible consensus has been achieved. The different ideal of the market partners are known and it is the responsibility of the individual companies to draw their own conclusions from them (where appropriate).

We expect discussions regarding „content handling“ for Smart TVs to continue on various, bilateral levels. The German TV-Platform will continue to follow this development and report on it on behalf of its members. If it should be necessary or expedient to address this topic again more intensively, the Smart TV WG will act accordingly to ensure that this happens. With immediate effect, the most important goal of the Smart TV WG is to set the direction for comprehensively activating HbbTV signalisation in end devices as standard.

In the appendix to the white book, we document the status of the discussions through various documents that have been brought into the German TV-Platform in the last three years and that have been discussed there:

- Discussion paper of the industry on the requirements of the VPRT of 2010
- ARD and ZDF’s requirements of HbbTV end devices as of August 2012
- Comments of ZVEI on the requirements of ARD and ZDF as of July 2012 (in reaction to the state of the discussions at the mid-year period)
The VPRT supports the guidelines brought in by ARD and ZDF as being the requirements of all content providers. However, additional requirements of the private stations apply to the VPRT members. These must also be observed and were discussed intensively in the working group as well.

### 3.3 Workshop of the German TV-Platform: „Smartphone to Smart TV: Apps conquer TV“

The German TV-Platform with its WG had seen the development from Hybrid TV to Smart TV in time and made it the topic of an event. At the workshop „Smartphone to Smart TV: Apps conquer TV“ on the 6th of April 2011 in the media city of Potsdam-Babelsberg, over 120 specialists discussed how Smart TV can add real value and provide a new television experience to viewers. This took place in the course of ten lectures and discussion groups. The unanimous opinion was that in addition to attractive content and services also a user-friendly navigation is essential. Uwe Welz, director of the ARD-Playout Center described rules how a combination of linear and non-linear television similar as HbbTV could be organised. This requires further understanding by all market players. Rike Brecht from the Ilmenau University of technology promoted consistent operation concepts in devices and services for a better user experience. With reference to the current different navigation concepts of the major TV broadcasters, Rike Brecht made clear that for the use of Mediathek services and digital videotext improvements of the navigation concepts are required.

Matthias Greve from VideoWeb illustrated how Hybrid-TV flatscreen televisions could become multimedia terminals and gave practical tips for HbbTV implementation in interactive devices. Prof. Claus Sattler, Managing Director of Goldmedia Innovation, does not see the development of consumer electronics stopping short at the TV screen. Instead, Smart TVs would be linked seamlessly with mobile end devices such as smartphones and tablet PCs. Dr. Stefan Arbanowski from Fraunhofer FOKUS gave an overview of the introduction of the web programming language HTML 5 and the related opportunities for the CE industry and the TV sector, including the possibility of cloud-based apps. Volker Blume, Philips Consumer Lifestyle, presented the various possibilities of Smart TVs. Along with a comprehensive media portal with access to content offers from the Internet and digital teletext from the TV broadcasters the devices offer an advanced interactive program utilizing the red button on the remote control. For the remote control of the Smart TV, Volker Blume sees a future for either the smartphone or the tablet PC.

How viewers will soon be able to buy directly from the remote control on a Smart TV was explained by Carsten Urbanski from Ping 24/7. According to Urbanski’s forecast, homeshopping will gain a new meaning with the connection between TV and Internet. This requires easy solutions for secure payment systems on Smart TVs. How well HbbTV is also suitable for B2B solutions was shown by Matthias Schwankl from Eutelsat Kabelfokus, using Kabelfokus Interactive as a white-label Portal for cable network providers. Lars Friederichs from SevenOne Intermedia outlined new advertising and marketing possibilities for commercial providers in a networked TV environment and announced new HbbTV applications for ProSiebenSat.1.
3.4 Symposium of the German TV-Platform on Second Screen: perspectives on Smart TV and Social TV

The trend for „Second Screen“ and therefore the perspective of Smart TV in combination with other end devices was a central theme of six specialist lectures and a podium discussion at the 21st Symposium of the German TV-Platform on the 24th of May 2012.

However, the simultaneous use of smartphones, tablet PCs or laptops alongside the stationary TV presents a danger that the viewers will become distracted. But the smart TV screen will not fall behind as a result of this, the contrary will happen. That was the conclusion of the event in the Rhein-Main Hallen in Wiesbaden with over 200 participants. Intelligent networking and synchronisation of the devices means that TV stations can benefit from the multi-screen applications. For the viewers, the second screens offers a clear added value through additional information, convenient interaction and social TV.

Guido Bülow from Südwestrundfunk said: „Viewers want to interact with the television programme and participate in community experience“. The online expert gave a comprehensive overview of worldwide apps and platforms for second screen applications. With the use of such apps, TV stations can already actively involve their viewers; as shown by first experiences of „Tatort+“ as an extension to the TV program to the Web.

Stephen Strubel from ProSiebenSat.1 also commented that the use of interactive applications is an important strategy for viewer loyalty for TV stations. ProSieben already experimented in the first season of „The Voice of Germany“ with social TV apps. These will be expanded after an overwhelming viewer response. But he emphasised that money has to be earned. Strubel added that the advertising industry is already interested in the new usage forms, but that its measurability still needs to be worked on.

Dr. Marc Mogalle of Zapitano showed that second screen services also provide opportunities for new companies. The start-up company sees itself as a social TV platform and wants to modernise television by turning it into „permanent public viewing“. The vision of television viewers as being members of a community is at the heart of Zapitano’s strategy; this community is connected by the TV medium. Dr. Mogalle said that second screens are not a threat, but that they breathe new life into the smart first screen.

Oliver Lewis showed how desired multi-screen solutions already are by using the example of „Sky+“ and „SkyGo“. This permits the pay TV subscriber to enjoy their favorite program on all the screens of their choice. Particularly popular is the use of Sky content on the iPad. Social features that have been recently introduced allow more interaction at Sky – both with the programme and with the community.

Dr. Peter Baum from Technicolor explained which available technology allows the synchronisation of first and second screens. He explained the method of audio watermarking and audio fingerprinting; both methods require a comparison of the data streams. Baum also sees the added value of second screen applications in the personalization of services.

Dr. André Schneider of Samsung showed how broadly the fields of application of Second Screen are: The smart screens can be connected to browse content, control content or use it on the go. For the „allshare“ offer, user generated content using the cloud are available everywhere and can be ported onto the TV screen of the neighbours via Second Screen. Also the networking of the devices is comprehensive. Tablets, smartphones and...
cameras are connected with flatscreens and Blu-ray players/recorders. Multifunctional applications also play a central role, such as the „smart view“ app from Samsung.

In the concluding panel discussion chaired by Prof. Ulrich Reimers from the Technical University Braunschweig, the question as to whether the viewer „still actually watches the TV itself“ was clearly affirmed. Dr. Andreas Bereczky (ZDF) and Andre Prahler (RTL Deutschland media group) emphasised that second screens only become attractive as a result of the content of the first screen. However, the inclusion of Social Media into the concepts of the programme providers has become necessary. In the opinion of the experts, the non-linear use of moving picture content is also becoming more important. Gert von Manteuffel (German Telekom) describes the development that is currently taking place as „Emancipating television from the television set“. Interoperability based on standardized procedures for the connection of first and second screen is the crux of the entire value chain, according to Gerhard Schaas. The chairperson of the German TV-Platform sees this as an important challenge for the companies in the coming months and years.

HTML5 expands Smart TV and HbbTV

An important role for the future development of Smart TV and HbbTV plays HTML5 as a new, emerging standard. HTML5 is not yet an official standard, however it is already widely used in some areas. It is used to develop web apps, which are websites with an app appearance that make touch functionality possible. They are able to run in the browser across all systems on virtually all operating systems. For providers and developers, they thus appear to be a bridge and as an efficient alternative to native apps, which would be programmed individually for iPhone, iPad, Android and other operating systems. Essential HTML5 procedures like WebSockets, Canvas, WebStorage and Application Cache enable intelligent apps with completely new user interfaces that work well on the Smart TV screen and outsources processing intensive or time-consuming tasks into the cloud.

An example of this are the projects of the agency CELLULAR, specifically the networking of third-party apps with Smart TV devices. At the same time, the pace of the HbbTV consortium for the integration of HTML5 into new future versions of the HbbTV standard is a logical step that shows how important this key technology is for multi-device apps.

3.5 Usability – Studies on Usage Concepts

With Hybrid-TV, there are new boundary conditions to be observed compared to those for the use of the PC/laptop/notebook. A key aspect for instance is the size of the screen. In the case of PCs/laptops/notebooks, this is comparatively small, whilst television devices use screens that are as large as possible. There is a direct link with the typical use of these devices. PCs/laptops/notebooks are primarily intended for a single user and the distance between viewer and screen is therefore relatively small. Television devices by comparison are designed as consumer electronics (CE) entertainment devices for more viewers and the distance to the screen is correspondingly large. There is also a substantial difference in operation. Here are the keyboard and mouse mainly used with PCs/laptops/notebooks, whereas it is generally the remote control for television devices.

This raises the question how Internet use with a television device should be designed in order to achieve sufficient acceptance among users. Apart from their presentation during the German TV-Platform workshop, representatives of the Ilmenau University of Technology have also referred on the topic on several other
occasions in the working group Hybrid End User Devices German TV-Platform. The following comments are
based upon these contributions.

The definition of the term „Usability“ can be derived from the standard DIN EN ISO 9241-11 „Ergonomic require-
ments for office work with visual display terminals, Part 11 Guidance on usability“ for the following definition:
„The extent to which a product can be used by specified users in a particular context of use to achieve specified
goals effectively, efficiently and satisfactorily“.

The following guidance criteria must be met:

• Effective solution of the tasks to be achieved
• Efficient use of the system
• User satisfaction

In principal users see Hybrid-TV positively because the extra Internet usage in parallel to the TV facilitates access
to more content. This includes, for example, the Mediathek services, that are now available on the TV screen,
the more diverse videotext but also the large number of applications which can be directly accessed by clicking
on an icon. Either way, this involves the effective adaptation of visual content onto the large television screens.
Another advantage is seen in the fact that all the information being current because of the Internet connection.

The joy of use will however only experienced by users when optimal usability is given. Here the user interface
and usage plays a major role. It should be noted that with Hybrid-TV, only the remote control is available. It pro-
vides for Internet use fewer features than the keyboard or mouse from PCs/laptops/notebooks.

The usage concepts must be supported on the following buttons on the remote:

• Number keys (0....9)
• Cursor keys
• OK key
• Colour keys (red, green, yellow, blue)

Here, the expectations of users should not be overlooked and usage should be designed to be equally simple
for children and senior citizens. This includes particularly that the current state of the system and ongoing actions
are clearly displayed. Each user action must thus lead to a clear feedback. The user would also like to have his
acustomed passive TV attitude (lean-back position) retained unchanged as possible and not change into an
active position (lean forward) for the Internet. In the case of Hybrid-TV, the various usage possibilities of television
devices should be also taken into account. Thus there would have to be distinguished between the individual
television use, a cosy TV night in a small circle, the broadcast of a sports event with more viewers or other
scenarios. A very important requirement is in fact that the user does not want to lose reference to the current
programme. Therefore a clearly indicated action must always show a quick return path to the previously visited
content.

Dipl.-Ing. Rike Brecht from the TU Ilmenau emphasises the fact that apart from the fundamental tasks, the spe-
cific tasks of the user must always be considered. The core tasks of an HbbTV offering include:
• Switching the HbbTV package on/off
• Navigation to the home page
• Navigation within the package
• Selection of video text
• Parallel television
• Personalisation
• Settings function
• Help function

The diverse content are usually displayed in the form of menus and it is therefore necessary to support the fast access to information through a transparent navigation. Only a few individual steps for navigation should be required.

The user must at all times have clear navigation links at his disposal to show how he can return to the start page of the Hybrid-TV package (home page) and this should be possible using just one operating procedure.

The videotext that is now available on Hybrid-TV is substantially more powerful than the previous version. For the user however, no changes to the usage operation should be necessary.

Especially in case of program related applications, there is often interest by users in watching these at the same time as a program, which is usually referred as parallel television. In order to do so, there should be various options. One would be to display the television picture in the background. Another solution could be the concurrent display of application and programme on either side of the screen which is known as „split screen“. Another popular concept is to display the television picture in small format in a corner of the screen. Switching back to the television programme in full format must in all cases be possible by means of a single usage procedure.

Personalisation means nothing else than the possibility for all users to provide the opportunity for applications and/or programmes with individual identifiers to permit targeted access. This includes bookmarks, favourites reminders and pre-selections.

When settings or the help function should be used, then it is absolutely vital that necessary instructions for the user are unambiguous and clear.

In all Hybrid-TV applications, special attention must be given to the legibility of text on the screen. In particular the font size play an important role to reflect the typical viewing distance of 2.5 m and more to the television screen. In case of PCs/laptops/notebooks, considerably more text can be better displayed on the screen because of the substantially smaller viewing distance.

Adapting to the situation in Hybrid-TV leads to the following requirements:

• Use a font of appropriate size
• Avoid long texts and work wherever possible with sub-headlines
• Reduce the horizontal extension of lines and rather separate into text blocks
• Design text blocks so that they can be accessed individually
• Avoid scrolling
These conditions for the layout on the screen correspond to the operational features offered by remote control with hybrid television. Their observation substantially influences user-acceptability.

This raises the question of how the requirements listed are satisfied shown in practice and here there are still considerable deficits because the offer is particularly heterogeneous and the user interfaces show a large variety of structures. This considerably affects user satisfaction and also sets high demands on future standardisation in this sector.

For the above reasons, there is a permanent need for action on the harmonization of user interfaces. This can be satisfied by the following activities:

- Definitely avoid long navigation strings
- Ensure that returning to the home page or last programme selected is possible via a single operating procedure
- Adapt the display size to the TV screen size
- Display each navigation feature using clear guides
- Ensure corresponding display of the system status and actions initiated by the user.

First tests and usability studies provide interesting indications – including one study commissioned by the German TV-Platform from the Ilmenau University of Technology (July-August 2011). The study was performed by the Institute for Media Technology by a team of scientists under the leadership of Prof. Heidi Krömker. It concerned the usability of HbbTV red button applications. The focus was on HbbTV offers from German TV broadcasters which are accessed via the red button function. The aim of this study was to identify the strengths and weaknesses of HbbTV Red Button offers to work out the usability optimization potential and provide style guide suggestions. As has been seen, the inconsistency in the user interface concepts of various TV broadcasters (e.g. colour key layout), the slow response time of several HbbTV offerings that had to some extent poorly visible navigation confirmation and missing personalisation features that confronted users with unpleasant usability issues.

"As however – apart from the actual services and information – the usability of the user interface concepts has substantially influenced the success and acceptance of HbbTV offerings, ergonomic guidelines should also be observed in design, as well as user-oriented development", according to the style guide "Usability of HbbTV Red Button Offerings" by the Ilmenau University of Technology. At the same time, there are concrete evidence to navigation, displaying information, speed of response, media control, help and personalization features.

The style guide proposes generic usability guidelines as recommendations for developers and designers of HbbTV offerings. Their intuitive operation has substantial influence upon whether the viewers take advantage of red buttons offerings as concluded not just by the Ilmenau researchers. A usability study by the ARD at the beginning of 2011 indicated that HbbTV services „at their current state of development were already very positively accepted by potential users and seen as clear added value to existing digital television“. Increased acceptance could be achieved by better usability and particularly harmonizing the user interface concepts of the various TV broadcasters."
3.6 New work focuses and open questions of the Smart TV WG

The Smart TV working group (formerly Hybrid terminals working group) of the German TV Platform has discussed and answered many questions since 2009. However, other points that have not been settled or new points for discussion continuously arise from the further development process.

Agreeing upon methods to educate customers/carry out marketing activities
Smart TV has become the phrase used to denote this technology in place of Hybrid or Connected TV. At the same time, the „HbbTV“ abbreviation is used more often for the standard – mostly in conjunction with the red button. The working group will continue its efforts to reach an agreed wording of all stakeholders in order to improve the marketing opportunities for Smart TV and HbbTV. It focuses on the information and education of consumer, describing the various facets related to Smart TV. All these activities are most effective if the market partners proceed together, having agreed upon all the chronological and content-related details in advance. Therefore one of the focuses of the Smart TV working group will be the support of the market partners in their marketing activities.

Usability of content
The simple method of accessing and using content and applications is often a key to the success of new devices and services. This has become especially clear in the market for smartphones, which has grown exponentially in the last three years. The providers of end devices have managed to introduce the new device functions in a playful manner. This has in turn, stimulated the development of interesting, diverse applications and services. The German TV-Platform is of the opinion that Smart TV devices and interactive services from TV stations and other providers have a similar potential. As such, the working group will pay greater attention to the user-friendliness and intuitive usage of HbbTV services as well as Smart TV. By doing so, we aim to contribute to more user-friendly solutions in the future as well.

OTT & Second Screen
The term Over the Top (OTT) refers to Smart TVs accessing online video and audio content. OTT TV is a method that allows the customer to receive Internet content on their television. The OTT provider often still prepares the content specifically for the TV set. Second Screens are also often used – especially for Social TV. The overview of these subjects in the white book is to be seen as the current preliminary results. The working group will observe and analyse the national and international market development here – especially in terms of the relationship with Smart TV and HbbTV services.

Business model and consumer protection
Just getting started in the market is the search for business models for Smart TV and HbbTV. Advertisements, E-Commerce and VoD are good indicators here. There are many issues to be clarified in all 3 areas, such as a user-friendly payment method, range measurement and types of advertising. There are also issues related to privacy and consumer protection – especially since Social Media is already incorporated into Smart TV („Social TV“). The WG will continue to monitor and analyse this development as well as contribute to an understanding of all parties.
Smart TV and regulation
Two services that were previously regulated differentially come together in Smart TV devices: TV is subject to
the broadcasting law, web content is subject to the telecommunications law and other services are not regulated
at all. There are also services that are preinstalled and applications are sometimes bundled. At the same time
services and apps are downloaded individually by the Smart TV user. The user can install/deinstall or sort the
services and apps themselves. Given the growing possibilities of Hybrid devices, a discussion regarding the
regulatory handling of Smart TV and the content is necessary. The German TV-Platform will introduce these
possibilities into the discussion, taking the heterogeneity of the membership into account.

DRM and content protection
Content protection is becoming more and more complex as the range of end devices and contents gets
increased. How will the content be played back over the various platforms such as TV set, smartphone or tablet
PC? What are the market needs of the consumers, Internet providers and device manufacturers? What can the
various procedures do and what does the market require? How can content protection work with all the devices
in the home network? The working group will tackle and discuss these issues.

Barker channels
HbbTV lends itself to being used in a hybrid manner to handle the transfer capacities of the existing DVB
distribution channels. In doing so a single still image is sent, which is linked to multiple online channels.
These Barker channels will be or are planned to become available shortly on DVB-T and DVB-S. The working
group will observe the development of this type of HbbTV usage and support it where appropriate.
4. Market situation, audience acceptance & forecast

4.1 Device Sales, Turnover Development

The figures from the retail panel of GfK Retail and Technology GmbH provide an overview of the sales of Smart TV to mid 2012. The number of TV sets sold has increased dynamically in 2012, flatscreen devices continue to make up the largest proportion of the Smart TV devices sold. As such, in the first half of 2012, a total of 3 million Smart TV devices have been sold on the German market.

Smart TV peripherals such as hybrid set-top boxes, Blu-ray players or web boxes currently are still a small share of about 20%. As of the middle of the year 2012, over 11 million devices were on the German market (TV+STB cumulative). In comparison with this: in the middle of 2011 it was only 4.5 million. According to the Consumer Electronics Market Index (CEMIX) from the gfu (Society for Consumer Electronics and Communications Electronics), BVT and GfK of the 16.08.2012, around 55% of the TV sets (iDTV) sold in the first half of 2012 were equipped with an Internet connection.

The number of Smart TV devices that have implemented the HbbTV standard is growing rapidly. Only approximately 8% of the devices supported HbbTV in 2011; in the first half of 2012 approximately 50% of all Smart TV devices supported it. Thus the share of HbbTV-capable devices has increased tenfold. There are currently a total of 2.8 million HbbTV-compliant devices on the market representing a quarter of all the Smart TVs available.

In conclusion, we can determine that the number of Internet-capable devices on the German market still continues to rise and has doubled within a year.

The gfu predicts over 9 million Smart TV displays in Germany by the end of the year 2012 (gfu Pr-08/2012). According to the specialist association ZVEI Consumer Electronics, around 30 percent of German households will be equipped with a Smart TV by the end of 2012 (ZVEI-Pr-84/2012). This prognosis does not take peripheral devices such as set top boxes and Blu-ray players into account, the total number of Smart TV devices should therefore again increase significantly.

4.2. Smart TV and audience acceptance

The ZVEI- Central Association for Electrotechnology and the Electronics Industry (Pr-84/2012) said: „Smart TVs have spread through German homes like no other new device“ (Pr-84/2012). The viewer’s interest and acceptance of Smart TV have been proven by the results of a representative online study of the GfK consumer panel, non-food & retail division. on behalf of the ZVEI Specialist Association Consumer Electronics of May 2012 (2,000 people above the age of 16 were surveyed).

On the one hand, the study determined that at the time of the survey, every fifth person surveyed (21%) used a main device that was Internet-capable (i.e. could be equipped with Smart TV).

The high connection rate of Smart TV was notable. The results of the ZVEI study indicate that 59 percent of Smart TV devices are already connected with the Internet.
Furthermore, it was found that the online function is regularly used on three-quarters (76 percent) of those devices that are connected with the Internet.

Online offers with a connection to television are especially popular in this context – these include video clips, media libraries, HD Teletext, weather reports and news. A further important result of the study is that the Smart TV functions make the TV set more attractive, as 27% of the Smart TV surveyed users indicated they spend more time in front of the TV.

27 % der Nutzer sagen, dass sie durch die Smart-TV-Funktionen mehr Zeit mit dem Fernseher verbringen.
The satisfaction of the customers also indicates a larger market acceptance. According to the ZVEI study, the majority of active Smart TV users are satisfied with the device. To be precise, 61 percent rated the navigation and menu guidance as being positive and 58 percent evaluated the range of contents as being positive.

Smart TVs are not just bought „by chance“. What’s more, Internet capability influences the purchasing decision for 50% of those surveyed. As the level of awareness of Smart TV functions is still low, this fact is far from trivial. Before the survey, two-thirds of households already knew that there are television devices that can display content and services from the Internet on the TV screen. However, only a few of those were aware of the common terms related to Smart TV. The expression „Video on Demand“ is the most well known, since 40 percent of respondents said that they knew what it was. However, only 16% had heard of „HbbTV“ and only 15% had heard of the „Red button function“. One of the conclusions of the study is therefore that educating and informing the customers is still needed. To this end, the ZVEI and the German-TV Platform are working towards this goal, producing publications like the „Pocket Guide to Networked Devices“ and the HbbTV flyer, both are available on the German TV-Platform website.

The wishes of consumers, who are still in decision of purchasing a Smart TV, can also be described as a television-type application, foremost the desire to watch missed shows on in the linear program on the TV screen.

For the fulfilment of these wishes, customers are willing to reach into their pockets and pay an additional charge, half of the respondents accepted 100 Euros on top for the Smart TV function, a tenth would even be ready to pay up to 200 Euros extra.
On the other hand, the ZVEI study determined that video formats are being increasingly consumed on other, not TV-specific screens. The study also showed that three-quarters (76 percent) of Germans today occasionally use other devices (apart from the TV) such as PCs, Notebooks, tablet PCs and smartphones to view video content. No real surprise was that the younger persons surveyed frequently used devices other than the TV for media consumption. About three-quarters of those under 25 year old indicated that they use mobile PCs often or very often. However, the television set remains the most widely used electronic device in the household across all generations.
In classical use of the TV traditional functions remain very popular. Approximately 80 percent of those surveyed reported using videotext on a regular basis. From this, we can deduce that there is an unofficially high potential for the introduction of the new HbbTV standard, enabling interactive television to TV sets that are connected to the Internet and allows replacing the 30 year old videotext with a CE-HTML based modern design with various additional functions.

- Videotext wird in allen Altersklassen intensiv genutzt.
- Das Aufzeichnen von Sendungen ist bei den über 60-Jährigen überdurchschnittlich verbreitet. 40% von ihnen zeichnen auf.
4.3 HbbTV and Market Development

The German TV-Platform is committed to open standards and norms for digital television technology. In particular, the German TV broadcasters have repeatedly pointed to the need for a standard in interactive television. As part of the German TV platform working group the development of an HbbTV specification was closely followed from the beginning. After the international standardization of HbbTV (Hybrid Broadcast Broadband Television) by the European organisation ETSI in June 2010, the potential for market players became ever clearer. Even the most recent GfK (Society for Consumer Research) sales figures indicate that the market trend is headed in the direction of HbbTV. It should be noted here that from the perspective of the CE manufacturers, HbbTV represents one of several functions of the Smart TV and device portals exist alongside HbbTV and that there is no cannibalism effect.

We shall now discuss the promising HbbTV standard in some more detail (see also chapter 2.2). HbbTV is repeatedly described as „the improved, modern videotext“ because it does much of what was with the old videotext technology not possible. It is fast and thanks to the Internet connection, television becomes interactive. Furthermore, HbbTV offers many possibilities for content of all types – starting from text through a variety of imaging through to high-resolution video. In addition to the added value of more content and new ways to use HbbTV brings even more benefits for broadcasters and viewers:

- Many HbbTV-based services are free of charge with the exception of the purchase cost of an HbbTV receiver.
- Because of its recognition by a European standards organisation, HbbTV is a standard system, so that the probability of an international distribution is very high. A mass market can be created resulting in a scale effect on the unit price.
- Using HbbTV a number of value-added services can be developed with high demand potential as well as modern usability and functionality.

For the use of HbbTV-based services a connection to an IPTV network is not required. This however applies also to all services offered via hybrid end devices. The disadvantage is that the quality of service (QoS) cannot be guaranteed (signal stability, uninterrupted real time transmission etc.).

Conclusion: Smart TV devices with HbbTV will provide users of classic satellite, cable and DVB-T with interactive television within the near future.
4.4. Trend forecasts and future opportunities

In view of the relatively still new HbbTV technology, trend forecasts can only be made upon the basis of market figures to date, as well as assessments from various market players that can often be of a subjective nature.

The following collection does not claim to be exhaustive:

The gfu – Gesellschaft für Unterhaltungs- und Kommunikationselektronik (Society for Consumer Electronics and Communications Electronics) believes in its report about IFA innovations „Trends in Consumer Electronics 2011“ that Smart TV still become massively important. The fusion of television and Internet, which has been a growing market trend for two years, is seen by the gfu as „not just a technological trend, but also a shift of paradigm in the business models for the CE sector. The successful linking of devices with content offers, as well as cross-industries cooperation between companies from the hardware and content industry, will considerably influence business success in future.“ At the same time, the gfu study indicates 50 percent of respondents are planning the purchase of a hybrid television within the next five years.

The chances of success for HbbTV as a standard platform for connecting linear television with individual types of use were excellent, announced the IRT (Institute for Broadcasting Technology) already referred at the ANGA Cable 2011 trade show. The easy and quick access to content, the intuitive use of program relevant information without media interruption and changing devices, the market penetration of high-definition flatscreens and the growing number of broadband connected homes, as well the experience of consumers with individual media use could contribute to market success. With HbbTV, there are new transaction opportunities for the Internet and advertising industries as well as portal solutions such as hotel television. The IRT announced that all major device manufacturers are supporting these developments in 2011.

Exactly this is now the case, there are hardly any manufacturers that do not support HbbTV. HbbTV is being implemented in more and more Smart TV models. More and more device models are being offered with Smart TV – even the devices with smaller screen sizes. Smart TV (and with it, HbbTV) are on the way to becoming standard products, such as iDTV already is. Television screens with built-in digital tuners and HDTV receivers have now completely replaced the „simple“ flat screens. Hans-Joachim Kamp, Vice President of the ZVEI (Central Association for Electrotechnology and the Electronics Industry) confirmed that there are hardly any devices left that are not Internet capable. He announced this during the press conference at the opening of the IFA conference on the 23rd of September 2012 in Berlin. And the trend is not limited to the German market: In 2011 HbbTV services were launched from broadcasters in France, the Netherlands and Spain. Other broadcasters are planning or testing HbbTV virtually anywhere in Europe.

Two further aspects that became apparent from a study carried out in 2011 by Facit Digital have now been confirmed:

- The majority of the technically savvy participants reported using television, the Internet and smartphones at the same time. The use of other screens other than the TV set for video media use (called „second screen“) is already no longer the exception. The German TV-Platform dedicated this year’s symposium in May 2012 to this phenomenon along with all its aspects, opportunities and challenges (see also chapter 3.3)
According to Facit Digital in 2011, those in the industry speak even more of „Smart TV“ instead of „HbbTV“. The term Smart TV has almost completely replaced the term „Hybrid TV devices“. Occasionally, the term „Connected TV“ is used, but the term „Smart TV“ has become more memorable for customers in the meantime. This has been reflected in the press as well. After a long period of confusion regarding the name, the industry has now agreed upon the memorable name „Smart TV“; this has the advantage that it resembles the term „Smartphone“

• The newspaper „Berliner Zeitung“ wrote a passage similar to this on the 21st of August 2012 (dpa)

• On several occasions, the German TV-Platform has determined through internal studies that „Smart TV“ is not yet the same as „HbbTV“. However, the trend is going in the direction where more and more Smart TVs are supporting the HbbTV standard (currently approximately 50% of the newly purchased devices, see Chapter 4.1). At IFA 2013 it would well be that you no longer need to distinguish between Smart TV and HbbTV.

By 2014, there will be a total of 23 million HbbTV enabled flat screen televisions in German households. This is the November 2010 forecast by the Munich based consultancy Mücke, Sturm & Company (MS&C) in their study „HbbTV“. The three factors that MS&C had set as a precondition for the breakthrough have now been largely fulfilled:

• an increasing market penetration of devices with integrated HbbTV
• high-end quality content, as well as
• a good user experience

Because of the open standard, HbbTV has the best chances to win against corporate based proprietary solutions such as Google TV and Apple TV. The study summarizes: „From device manufacturers to broadcasters to online portal- and e-commerce providers, all of them benefit from the free market approach of HbbTV, an approach that promotes diversity“ This analysis is still valid.
5. Glossary  Important terms and abbreviations

detailed explanations and further terms are available at:
www.tv-plattform.de/de/digitales-fernsehen/glossar.html

Ad(vertisement) Forwarding  Manual skip of advertising breaks within an audiovisual program by fast forwarding within the course of the recorded programme.

Ad(vertisement) Skipping  Automatic skip through advertising breaks within an audiovisual programme within the course of the recorded programme.

Android  Operating system of the Google Internet service.
Will be used for Google TV.

App  Industry standard abbreviation for the term application.

Application  A defined interactive service via the Internet for smartphones, tablet PCs and also Smart TV devices. Usually depicted as the logo of the service / provider in the form of a miniature ‘tile’.

Authentication  Process of secure connection of a user to a system.

Bound application  Application that relates directly to the current television program.

Broadband Access  Internet connection with a data transfer rate of at least 1 Mbit/s.

Catch-up TV  Collective term for time delayed TV that can be viewed on demand – for example in media libraries. Catch-up TV can also be used on TV screens through the HbbTV standard or via the app portals of Smart TV devices.

Connect(ed) TV  A comparative market term for hybrid television.

Consumer electronics hypertext markup language
= CE-HTML  Version of the programming language HTML that is used on the Internet adapted for use in consumer electronics devices.

Crossmedial  The deployment of various media for one purpose.
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data rate</td>
<td>The amount of data that is transferred per unit of time via a cabled or wireless connection. This is indicated in bits per second as Kilobit, Megabit or Gigabit.</td>
</tr>
<tr>
<td>Electronic Programme Guide / EPG</td>
<td>Electronic programme guide that provides the user with detailed information about television programmes, radio programmes and screen services available to the user.</td>
</tr>
<tr>
<td>Fade over</td>
<td>Fully or partially cover a running picture by another one.</td>
</tr>
<tr>
<td>Google Chrome</td>
<td>Browser of the Internet service Google. Will be used for Google TV.</td>
</tr>
<tr>
<td>Graphical user interface / GUI</td>
<td>The arrangement and function of the operating elements for the user in devices and systems. The linguistically correct term would be operational interface.</td>
</tr>
<tr>
<td>HbbTV</td>
<td>The abbreviation stands for Hybrid broadcast broadband TV and has been a European standard since mid-2010 that defines the technical specification for the connection of TV and Internet packages in TV reception devices with an Internet connection. A central feature is the red coloured Teletext button on the TV remote control (red button function).</td>
</tr>
<tr>
<td>Hybrid Television</td>
<td>In addition to broadcast content such as linear TV broadcasters, services from the Internet can be used on Smart TV devices.</td>
</tr>
<tr>
<td>Interactivity</td>
<td>Bi-directional communication of the user of a system with the aid of a return channel.</td>
</tr>
<tr>
<td>Internet-capable TV Device</td>
<td>Television device that both has connection for broadcast signals (antenna, cable, satellite) as well as an Ethernet of WLAN connection for signals for the Internet and which can display these in correct format.</td>
</tr>
<tr>
<td>Internet-TV</td>
<td>see: Web-TV</td>
</tr>
<tr>
<td>Interoperability</td>
<td>The usability of devices at different networks and/or for different applications.</td>
</tr>
<tr>
<td>Intuitive Operability</td>
<td>Self-explanatory operation of devices and systems, so that the user requires neither a manual nor training for operation.</td>
</tr>
</tbody>
</table>
IPTV
Abbreviation for „Internet Protocol Television“. This denotes the transmission of television via a managed DSL network using the Internet protocol. Unlike Web TV, IPTV has a guaranteed signal quality so that programs can be viewed on television. IPTV already established itself in 2006 as fourth broadcast transmission method beside satellite, cable and terrestrial.

LAN
Stands for Local Area Network and enables data to be exchanged via a cable. If the data exchange takes place wirelessly, then it is called WLAN (also called WiFi).

Language recognition
The control of operating processes by voice input.

Linear Television
Concurrent direct reception of running television programmes

Mediathek
An online video on demand service that provides a simple and clear access to various audio and video files available online.

Media interruption
Different devices for the use of media.

Network / Home Network
A connection of networkable home entertainment components (TV, Blu-ray players, gaming consoles, PC, data memory etc.) that is made into a private network either linked by cable or wirelessly in several rooms or throughout the house.

Non-linear television
Time-delayed reception of television programmes via intermediate storage or video on-demand. (see VOD).

OTT (over the top) / OTT TV
The expression refers to the online transfer of video and audio content. The transfer takes place regardless of the bandwidth the user has and the material can be displayed on all Internet-capable devices. If the device in question is a TV set, then it is referred to as OTT TV.

Overlay
Overlaying image content on the screen by other content.

Package (service)
A structured package of random information via the Internet connection for hybrid television devices.

Personalisation
User-specific set of programmes, services and applications.
**Picture-in-Picture / PIP**
Supplement a second picture in a small format with a running screen display in large format. There may also be two equally large formats that are displayed beside each other on the screen (see split screen).

**Proprietary**
Technology that is only valid for one manufacturer or provider and generally developed by them.

**PVR**
Personal video recorder in the form of hard drives, Blu-ray or DVD recorders or as a receiver/set-top box with integrated hard drive. Also, some televisions have built-in hard drives for digital recording. Allows timeshifting.

**“Red button“ function**
You can use the red Teletext button on the TV remote control to start and end program related applications whilst a television program is running.

**Second Screen**
Refers to a mobile display device (tablet PC, smartphone) that can interact with Smart TV devices. The device can also interact with the participants of a social network via TV programmes (Social TV).

**Signal integrity**
The consistency of the television signal received during playback.

**Signal protection**
Measures against changes in the program signal being transmitted.

**Smart TV**
Generic term for the new generation of television: television and other CE devices, with which viewers can access a variety of additional services and content from the Internet. This takes place via an app gallery or whilst the program is running via HbbTV.

**Smart TV Alliance**
For Smart TV Alliance, the company LG, Philips / TPVision and Toshiba have joined forces in early 2012. Its aim is to standardise the methods used in programming apps designed for TV device portals, as these methods have differed from one another in the past.

**Split Screen**
Separation of the screen for the concurrent display of a television programme and an application or the concurrent display of two television programmes.

**Streaming**
The distribution of video content that can be received over the Internet as a continuous data stream without first having to be downloaded.
**Time-delayed television / Timeshift**

Also known as time-delayed television (see Non-linear television). Permits the flexible pausing, repeating and continuing of the current TV programme.

**Unbound application**

An application which is not related to the current television programme.

see: Programme-independent application

**Usability**

A general term for the extent to which a device or system can be operated easily by a normal user.

**User Data**

All relevant information about the user of service or applications.

**USB (Universal serial bus)**

Computer interface for connection external components. Today, many TVs and connectable devices such as Blu-ray players and gaming consoles have USB interfaces so that USB sticks or external hard drives can be connected.

**Video-on-Demand (VoD)**

Service that allows to receive a video at any time from an available package. Differentiation is made between on-demand streaming (no download), near on-demand streaming (loop or carousel), download (saving possibilities) and podcast (download with subscription function).

**Web TV**

In the case of Web TV, random program that are freely accessible on the Internet can be used at any time and anywhere. Unlike IPTV the TV reception is not guaranteed.

**Widget**

Small programs that appear as icons on the TV screen (or computer desktop). With their help, certain Internet services can be used – also on some Smart TV devices.
6. Sources

Vorwort
http://www.tv-plattform.de/de/arbeitsgruppen/smart-tv.html
http://www.gfkrt.com/de/
http://www.gfkrt.com/de/services/ad_hoc_research/unterhaltungselektronik_studien_der_gfk_rtl/index.de.html

Kapitel 1
http://www.medien-perspektiven.de/6658.html
http://www.tv-plattform.de/de/dokumente/dokumente-internetatv.html
http://www.tv-plattform.de/de/digitales-fernsehen/glossar.html
http://www.smarttv-alliance.org/

Kapitel 2
http://www.hbbtv.org
http://www.irt.de/de/themengebiete/digitales-fernsehen/hbbtv.html
http://www.irt.de/de/produkte-beratung/digitales-fernsehen/hbbtv.html
http://social-tv.muecke-sturm.de/?lang=de
http://www.teveo.de/produkte-und-services/
http://www.ping247.de/ping-next/concept-einkaufen-mit-2-klicks/
http://www.google.de/tv/
http://www.apple.com/de/apple-tv/
http://de.yahoo.com/
http://www.skype.com/intl/de/get-skype/on-your-tv/

Kapitel 3
http://www.tv-plattform.de/de/hybrid-workshop.html
http://www.tv-plattform.de/de/21-symposium-informationen.html
http://www.cellular.de/
http://www.medien-perspektiven.de/6278.html
www.dlm-symposium.org/de/symposium.html

Kapitel 4
http://www.gfu.de/home/download/marktstudien.xm.htm
http://www.angacable.com/index.php?id=pressreleases&no_cache=1&L=1
http://www.irt.de/de/presse/presseinformationen.html
http://www.gfu.de/home/download/praezentationen.xhtml
http://www.facit-digital.com/studien/
http://www.muecke-sturm.de/de/publikationen

7. Appendices (in german)

- ARD and ZDF’s requirements of HbbTV devices as of August 2012
  Page 48–49

- Comments of ZVEI on the requirements of ARD and ZDF as of July 2012
  (in reaction to the state of the discussions at the mid-year period)
  Page 50–52

- Discussion paper of the industry on the requirements of the VPRT of 2010
  Page 53–55
### Allgemeine Anforderungen

1. Endgeräte, die HbbTV-Anwendungen von ARD und ZDF über Portale zugänglich machen, müssen HbbTV vollständig standardkonform, d.h. inkl. Red-Button-Funktionalität und mit aktiver Signalisierung bei linearem Empfang, implementiert haben.

2. HbbTV-Anwendungen, die ARD und ZDF über das Internet zur Verfügung stellen, können zusätzlich in Portalen oder ähnlichen speziellen Zusammenstellungen gelistet und verlinkt werden, sofern ARD bzw. ZDF dem jeweils für ihre Programme und Angebote zugestimmt haben.


5. Für die Präsentation und die Suche von Inhalten von ARD und ZDF sind in erster Linie die Metadaten zu nutzen, die diese im Sendesignal bzw. extern für ihre Inhalte zur Verfügung stellen. Suchergebnisse dürfen nicht beeinflusst werden.

### Zugang zu HbbTV-Portalen


11. Für die Kennzeichnung von Anwendungen in Portalen sind die von ARD und ZDF dafür bestimmten Kennzeichen (Kons, Logos etc.) zu verwenden.


16. HbbTV-Endgeräte müssen die Privatsphäre der Nutzer schützen und im Deutschland geltende Datenschutzrechte einhalten.
Kommentierung der Anforderungen von ARD/ ZDF an HbbTV-Endgeräte, Stand 26.03.12

Im Rahmen der AG Smart TV (ehemals AG Hybride Endgeräte) der Deutschen TV-Plattform, sowie in bilateralen Gesprächen mit dem Fachverband Consumer Electronics (ZVEI) haben ARD und ZDF ihre Anforderungen an HbbTV-Endgeräte eingebracht und diese im Dialog mit den Herstellern weiter entwickelt. Die nachfolgenden Kommentare des ZVEI beziehen sich auf den Anforderungskatalog an HbbTV-Endgeräte von ARD und ZDF mit Stand 26.03.2012:


Von der Systematik des Forderungskatalogs her sei angemerkt, dass einige Punkte deutlich weitergehen als die Überschrift des ARD/ZDF Papiers ("Anforderungen an HbbTV-Endgeräte") in Aussicht stellt bzw. systemfremd sind. Dies ist insbesondere überall dort der Fall, wo auf Geräteportale, Ausgestaltung von Fernbedienungen oder Gerätefunktionalitäten eingegangen wird. Die Mitglieder des ZVEI nehmen die diesbezüglich formulierten Bedürfnisse der TV-Sender ernst, behalten sich aber abweichende Entwicklungen vor dem Hintergrund der rasanten Weiterentwicklung der Technik vor.

1. Standardkonformität, Ziffer 1

2. Portaltaste, Ziffer 8

und Personalisierung des Portals, URL Eingabe, Ziffer 10
Die Anforderung, nach der Portale über eine separate Taste auf der Fernbedienung (Portaltaste) oder eine entsprechende on-screen Signalisierung unmittelbar erreichbar sein, dass eine Personalisierung des Portals durch den Nutzer sowie eine manuelle URL-Eingabe möglich sein sollte, wird von einer zunehmenden Zahl von Geräten erfüllt. 2

Nichtdestotrotz sollte die Produktgestaltung von Endgeräten denen überlassen werden, die das wirtschaftliche Risiko dafür tragen, dass ein Produkt vom Markt, d.h. vom Kunden angenommen wird.
Da die Hersteller aber selbst ein hohes Interesse daran haben, die Portale für den Zuschauer möglichst leicht zugänglich zu machen, kann davon ausgegangen werden, dass eine entsprechende Taste auf der Fernbedienung vorgesehen wird. Die Ausgestaltung der Portale einschließlich des Grades ihrer "Personalisierung", etwa über die Option, Favoritenlisten anzulegen, die Darstellung von Anwendungen zu sortieren oder auch eine freie URL-Eingabe zu ermöglichen, liegt in der Entscheidungshoheit der Hersteller, die das wirtschaftliche Risiko für die Annahme des Produktes im Markt tragen.

Da Hersteller aus Gründen der Kundenakzeptanz ein hohes Interesse daran haben, die Portale für den Zuschauer so flexibel und nutzerfreundlich wie möglich zu gestalten, kann davon ausgegangen werden, dass eine Personalisierung grundsätzlich auch immer ermöglicht wird, wo dies technisch und wirtschaftlich machbar ist. Für den Verzicht auf die freie URL-Eingabe sprechen aus Sicht mancher Hersteller Überlegungen zu Datenschutz und Qualitätssicherheit. Diese Beweggründe sollten respektiert werden.

3. Mindeststandards, Ziffer 7
Nach der Vorstellung von ARD und ZDF sollen für die Darstellung und Listung von Anwendungen in Portalen der Gerätehersteller „Mindeststandards“ abgestimmt werden.


4. Ein- und Überblendungen, Skalierungen, Ziffer 4

Leider ist es aus Sicht der CE-Industrie nicht realisierbar, die parallele Darstellung von zwei oder mehreren Diensten aus unterschiedlichen Quellen bei Aufruf durch den Nutzer unter den Vorbehalt einer vorherigen Autorisierung der TV-Sender zu stellen.

Angesichts der rapider zunehmenden Vielfalt an hybriden Geräten und der darauf verfügbaren Dienste aus dem Internet, sind die Kombinationsmöglichkeiten von Rundfunk und Web-Applikationen in 37 Mio. deutschen TV-Haushalten unüberschaubar und eine vorhergehende Einigung zwischen ARD, ZDF und sämtlichen Dritten, schlicht nicht zu realisieren. Der ZVEI verweist daher auf seine bereits in 2012 formulierte Position:

Eine Skalierung wie auch eine teilweise Überblendung des laufenden Signals eines Senders mit Inhalten Dritter muss aus Sicht der Industrie möglich sein, wenn dies durch vorheriges Tätigwerden, d.h. auf ausdrücklichen Wunsch des Nutzers, vorgenommen wird. Hierbei kann es sich sowohl um eine Umsetzung als Bild in Bild, als Split Screen oder Overlay handeln. In der Handhabung werden sich die einzelnen Hersteller voraussichtlich voneinander differenzieren.

Automatisierte Einblendungen sollen dagegen nur dann erfolgen, wenn der Nutzer in seinem Einstellungsmenü entsprechende Notifikationen ausdrücklich zulässt. In diesem Fall hat der Hersteller aber keinen Einfluss auf die jeweiligen Inhalte Dritter und kann diese weder kontrollieren noch filtern.

Aus Sicht der Industrie hat der Nutzer eines Gerätes die Hoheit über den von ihm erworbenden Bildschirm, und muss somit darüber entscheiden können, welche Inhalte er wann, in welcher Form und Größe und in welcher Zusammenstellung konsumiert.

Zu begrüßen ist dagegen die Klarstellung, dass die Anzeige von Gerätefunktionen (Lautstärke, Helligkeit etc.), und Erinnerungsdienste für Privatkommunikation (Hausgerätesteuerung, Soziale Netzwerke, E-Mail und Skype) von der Einschränkung der Vorab-Autorisierung durch ARD/ZDF ausgenommen sind.


Nach Vorne blickend ist dem ZVEI sehr daran gelegen, das gemeinsame Ziel, den Mehrwert von HbbTV und Smart-TV für die Zuschauer deutlich zu machen, weiterhin im engen Dialog mit den TV-Sendern zu verfolgen.

Frankfurt, den 18.07.2012
Diskussionspapier der Industrievertreter
in der AG Hybride Endgeräte
zur Integration von Broadcast und Broadband
der Deutschen TV-Plattform

Der VPRT hat im Rahmen der AG Hybride Endgeräte der Deutschen TV-Plattform eine Reihe an Anforderungen an die Hersteller sogenannter hybrider Endgeräte formuliert, welche sowohl den Empfang von Rundfunk über einen klassischen Rundfunkempfangsweg als auch die Nutzung weiterer, elektro- nischer Daten- und Kommunikationsdienste mittels Breitbandinternet ermöglichen.

Die Industrie möchte die Gelegenheit wahrnehmen, hierzu Stellung zu nehmen.


Als wichtige Grundlage für einen Massenmarkt für hybride Endgeräte sehen wir die Verständigung auf einen gemeinsamen Basis-Standard der Industrie, mit ausreichendem Raum für Differenzierungsmerkmale einzelner Hersteller.

1. Umgang mit Client Zertifikaten

Die Forderung nach Client Zertifikaten sieht die Industrie kritisch, da die Implementierung von einzelnen Zertifikaten unmittelbar die Erkennbarkeit von Geräten nach sich zieht. Eine Differenzierung nach Herstellern lehnt die Industrie daher ab.

Die Vorgabe von Zertifikaten darf auch insbesondere nicht dazu führen, dass Sender-spezifische Zertifikate mit unterschiedlichen Forderungen einzelner Sender verknüpft werden. Stattdessen bedarf es aus Sicht der Industrie einer von allen Sendern abgestimmten gemeinsame Anforderungsliste, die es dann seitens der Industrie zu erfüllen gilt. Zugleich ist aber ein verlässlicher Mechanismus einzuführen, der sicherstellt, dass die Sender/Inhalteanbieter auch sämtliche, mit entsprechenden Zertifikaten ausgestattete Geräte unterstützen, d.h. ihre Inhalte diesen Geräten zur Verfügung stellen.

Dadurch soll sichergestellt werden, dass dieses Instrument nicht dazu missbraucht wird, einzelne Gerätehersteller zu bevorzugen (indem man ihnen z.B. einen anderen/besseren Inhalt anbietet) oder zu diskriminieren (indem ihnen gewisse Inhalte nicht zur Verfügung gestellt werden).

Der Vorschlag einer bilateralen vertraglichen Ausgestaltung zwischen Sender und Endgerätehersteller ist jedenfalls bei der Anzahl der Sender und Endgerätehersteller nicht organisierbar. Es ist stattdessen darauf hinzu arbeiten, dass die Pflichten der Sender und die Pflichten der Gerätehersteller generisch ausformuliert und akzeptiert werden.

Um dem Wunsch der Sender nachzukommen, die Verbreitung von Inhalten gegenüber den Rechteinhabern abzusichern, ist die Industrie aber bereit, mögliche Modelle wie etwa die Implementierung von typisierten (d.h. nicht herstellerspezifischen) Zertifikaten, z.B. nach Gerätetyp (PC/STB/iDTV), oder von Zertifikaten die eine Standardkonformität ausweisen, näher zu diskutieren.

2. Überlagerung des Fernsehbildes, Integrität des Signals


Eine Skalierung wie auch eine teilweise Überblendung des laufenden Signals eines Senders mit Inhalten Dritter muss aus Sicht der Industrie möglich sein, wenn dies durch vorheriges Tätigwerden, d.h. auf ausdrücklichen Wunsch des Nutzers, vorgenommen wird. Hierbei kann es sich sowohl um eine Umsetzung als Bild in Bild, als Split Screen oder Overlay handeln. In der Handhabung werden sich die einzelnen Hersteller voraussichtlich voneinander differenzieren.

Dagegen ist die Industrie bereit, auf automatisierte Einblendungen zu verzichten. Eine Ausnahme soll aber gelten, wenn der Nutzer in seinem Einstellungsmenü entsprechende
Notifikationen ausdrücklich zulässt. In diesem Fall hat der Hersteller aber keinen Einfluss auf die jeweiligen Inhalte Dritter und kann diese weder kontrollieren noch filtern.

Aus Sicht der Industrie hat der Nutzer eines Gerätes die Hoheit über den von ihm erworbenen Bildschirm und muss somit darüber entscheiden können, welche Inhalte er wann, in welcher Form und Größe und in welcher Zusammenstellung konsumiert.

3. Verbot von Ad Skipping, Ad Forwarding im Rahmen von gestreamten Inhalten

Grundsätzlich versteht die Industrie die Notwendigkeit aus Sicht der Sender, ihre Geschäftsmodelle für IP-gestreamte Inhalte zu schützen und zukunftstauglich zu gestalten.

Für den Kunden ergibt sich aber eine Verschlechterung der Situation sowohl gegenüber dem klassischen Rundfunk, wo es während der Laufzeit der Werbung jederzeit möglich ist, auf ein anderes Programm umzuschalten, als auch gegenüber der Internetnutzung, bei der parallel zu Inhalte/Werbung noch weitere Applikationen geöffnet sein und genutzt werden können, bzw. die Werbung lediglich einen Teil des Bildschirms einnimmt.

Aus kommerziellen Gesichtspunkten heraus hält die Industrie es für notwendig, einen dieser beiden Lösungsansätze auch für Werbung im Rahmen von IP-gestreamten Inhalten anzudenken. Andernfalls werden die Nutzer andere Lösungen finden, sich zum Beispiel ein zweites Empfangsgerät zulegen, und parallel konsumieren.

Für die Industrie ist als Schnittstelle zum Kunden stets notwendig, die bestmögliche Kundenfreundlichkeit der Geräte und deren Funktionen herzustellen. Daher ist es für die Industrie auch erstrebenswert, eine Funktion, die das Vorspielen von Inhalten ermöglicht, anzubieten. Sollte eine solche Funktion aus wirtschaftlichen Gründen für einzelne Dienste ausgeschlossen werden, ist es auch notwendig, den Nutzer aufzuklären, warum er gewisse – gelernte -Funktionen nicht bedienen kann, und ihn über die Hintergründe dazu informieren, etwa über eine Information auf dem Bildschirm.

4. Speicherung von Streaming Inhalten


5. Zusicherung eines Regelbetriebs des neuen Teletextes

Bislang ist der Industrie nicht bekannt, wann der neue, CE-HTML basierte Teletext der Sender starten soll. Bei der Diskussion um die „commercial requirements“ sollte nicht vergessen werden, dass die Verfügbarkeit von Inhalten ausschlaggebend ist, um die erweiterten Funktionen hybrider Endgeräte für den Kunden attraktiv zu gestalten. Die Industrie wünscht sich daher zuverlässige Aussagen aus Sicht der Sender (öffentlich-rechtlich wie privat), wann der Regelbetrieb eines neuen Teletextes von welchen Sendern starten wird.

6. Absicherung der Ausstrahlung von kompatiblen Content

In den Anforderungen (Commercial Requirements) der Arbeitsgruppe "Hybride Endgeräte der Deutschen TV-Plattform sind neben Pflichten der Endgeräteindustrie auch Pflichten der Sendeanstalten zu beschreiben und abzusichern. Dazu gehört auch eine Beschreibung des Contentangebots, etwa nach HbbTV-Standard und eine Regelung der Vorgehensweise bei Streitfällen.

Stand: 22.1.2010
Authors:
Rike Brecht (TU Ilmenau),
Gernot Busch (Busch Consult),
Carine Chardon (ZVEI/Deutsche TV-Plattform),
Ulrich Freyer (Agentur für Medientechnik),
Anja Hornbostel (IfN, TU Braunschweig),
Andreas Karanas (teveo interactive),
Klaus Merkel (IRT),
Jürgen Sewczyk (JS Consult/Deutsche TV-Plattform),
Holger Wenk (Deutsche TV-Plattform)

Our particular thanks to GfK Retail and Technology GmbH
for the provision of market data.

Translation:
Dorothea Eßer (Technik-Sprachendienst GmbH),
Martin Hafner ( Bayerischer Rundfunk),
Peter Yves Ruland (ruwido austria GmbH)

Liability:
The information in this report were accurately and thoroughly re-
searched and consolidated to the best of the knowledge and under
neutral approach of our Working Group. Any information reflect the
current status at the time of the editorial deadline for each chapter.
However, the members of the Working Group and the German TV
Platform do not warrant for actuality, correctness, completeness
and/or quality of the compiled informations. Any liability claim
against the German TV Platform based on damages incurred on
material or immaterial grounds, caused through use or omission of
the presented informations or through use of false or incompletes
informations, are excluded in advance by principle.