Digitisation
Imposed enrichment: Is there a need for privileging plurality?
Digitisation 2017
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Preface

Preserving plurality is something that does not happen by itself but requires attention, and good regulation can ensure plurality. For guiding consumers through the variety of offers, platform operators increasingly resort to recommendation systems. Viewers can find content in yet a different fashion when they are steered by editorial and algorithm recommendations. The question which arises, however, is whether plurality in this regime needs special privilege or whether the wrong offers are pushed in the direction of the users, no matter how well intended the recommendation may be. The officials in charge of drafting media legislation for the German states are currently reviewing the need for amendments to the Interstate Broadcasting Treaty and are analysing these questions. The German media authorities provide advice in the consultation process – after all, the issues at stake concern key points in the roadmap guiding platform regulation.

The issues that are presently forming the focus of debate in the context of any potential privileges for the findability of content at the level of media legislation are explained by Dr. Matthias Försterling in his article. In the discussions and position papers presented by the players of the industry, no clear and concrete joint direction emerged for this reform process on any of the relevant issues. As regards plurality and how to care for it, everyone insists on their own respective approach.

By marked contrast, the route along which the broadcast transmission infrastructures are moving forward has been abundantly clear for years as once again evidenced in this year’s report on digitisation: The transformation of technology from analogue to digital is making further progress, as is the transformation from SD to HD transmission. In this process the media authorities again did a lot more than merely to watch the developments taking place: They moderated the switch-off and switchover processes and organised regular “Round Table” discussions with all parties involved in these proceedings again which provided a suitable means for the joint communication vis-à-vis the experts and the general public.

The days of the analogue cable are numbered: Over recent years the share of households resorting to analogue signal reception has seen a steady decline, and this year, the digitisation of the cable infrastructure is again taking a major leap towards the 90 per cent mark. Dr. Kristian Kunow outlines the facts and figures in his article on the current status of digitisation in Germany.

DTT is in the process of being switched off: Since the start of DTT2 HD at the end of March, terrestrial television transmission has been experiencing a process of change which is reflected in the figures for 2017: Compared to last year, the rate of terrestrial television households overall is going down; the details of this development can be found in the facts and figures section of this
report. In some regions the switchover has still to be effected, and the trends to be found next year will reveal whether new offers provided as HD content available through the air will gain in acceptance.

HDTV has become even more popular: The share of households receiving HD television has experienced a marked increase over last year, not least thanks to DTT2 HD.

A varied broadcasting landscape has for a long time also featured live streaming and video-on-demand offers. As the study shows, over-the-top reception via the smartphone, the media libraries of the broadcasters or YouTube, Netflix & Co. are being resorted to by ever-increasing numbers of consumers.

Plurality is also undergoing change and converting to high-definition. Laurence Cribier and Richard Topham analyse media use from a European perspective and also identify positive trends for Ultra HD and OTT.

Radio reception mirrors the positive trends to be found for digital technology overall: The number of receivers available has again seen a rise in all German states, and both at home and in the car, radio listeners in Germany now have a considerably higher number of receivers at their disposal than a year ago. Overall, DAB+ has already made its way up to second place in the ranking of the most popular reception infrastructures, topped only by VHF; for the first time, the number of listeners resorting to DAB+ reception is exceeding that for cable or satellite listening. As Adrian Gerlitsch concludes in his analysis of the digitisation of radio, DAB+ is here to stay.

A jointly drafted roadmap now marks the route towards integrating the results of the analysis on audience reach via DAB+ into the converged currency offered by the ma Audio survey. Dr. Kristian Kunow presents the results of the survey which was commissioned by the media authorities for the last time this year in a folder. As specified in the roadmap, the DAB+ (channel) audience reach will be researched as an agma survey starting in 2018.

As the “Round Table” strategy of the German media authorities to date proves, projects turn into success stories through intensive discourse and good communication strategies. This experience might also hold true for the reform process concerning media law which is currently under way: An open debate of arguments and proposals can further sound political decisions. The media authorities are ready to act as contacts for taking care of plurality – be with or without privileges, but increasing variety at any time.
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Platforms in the focus of the debate on media legislation

The debate about reforming media legislation in Germany continues in full swing, and there is no shortage of issues for discussion, be it whether internet television offers should be subject to obligatory licensing or how to fight hate speech and fake news in social networking sites. As regards the digital transmission of broadcast content, however, the debate centres on another question, namely the appropriate amendment of the rules governing platform regulation for achieving future-oriented provisions that are suitable in the world of converging media.

Platform providers offer broadcasting services and comparable telemedia via digital transmission routes as an overall package. Players in this field include, above all, cable network providers such as Vodafone Kabel Deutschland and Unitymedia, but also operators such as Media Broadcast which started its new terrestrial service freenet TV in March 2017. These providers form a core element for securing the plurality of opinions and offers as they determine which services can gain access to technical distribution capacities on their platforms and thus reach media consumers.

The Interstate Broadcasting Treaty (RStV) stipulates a number of requirements linked to this “gatekeeper” position. It requires operators to notify the start of their services as well as the programme listings; it establishes limits regarding the alteration of services and the marketing of distributed channels, and details the provisions for content which must be provided on a platform (so-called “must carry” offers). But the Treaty goes even further: By prohibiting discrimination and impediments, it impacts on the other terms of access. Broadcasters providing comparable offers must not be treated differently as regards access to a platform concerning the technical and the financial conditions, unless this can be justified by a clear and comprehensible reason.

As this outline of the regulatory provisions shows, there are varied options at hand for influencing the distribution of broadcasting offers and thus for influencing how a service is actually perceived. It will therefore not come as a surprise that the debate concerning the amendments of the platform...
provisions contained in the Interstate Broadcasting Treaty is very detailed and hence taking some time. Key issues in the discussion firstly centre on how to ensure an adequate balance for finding offers and privileging public-value content, but also on extending the ban relating to changes on a platform and on the adequate amendment of the regulatory framework to accommodate new digital phenomena.

Ensuring balanced findability
To ensure a balance for findability, non-discriminatory and equal access of broadcasting services to platforms and user surfaces must be taken into consideration. The increase of content becoming available as a result of digitisation therefore causes problems with a view to finding a specific content. Services given a less prominent position on the navigation surfaces devised by the cable network operators will hardly be found by users in the abundance of offers provided. Furthermore, it appears unlikely that users will come across content by chance when they are zapping through the offers which are presented far down the channel listings. Looking at how media are consumed today, the attention of users has become a scarce commodity anyway.

Getting a service positioned as prominently as possible on a user surface that steers attention or an electronic programme guide (EPG) thus turns into a key factor. Equally, a good position of a service is essential for advertising-funded commercial offers which depend on the attention of viewers in order to ensure that such offers can be funded in the first place.

The proposal of the State Chancellery of Northrhine-Westphalia
In April 2017, the State Chancellery of Northrhine-Westphalia presented legislative proposals to be debated by the working group dealing with platform regulation set up under the joint Commission of the Federal Government and the German States which studied the issue of the convergence of the media. The proposals and the subsequent consultation process among other things address the question how a balance for findability can be ensured, and reflect the current state of the discussion concerning platform regulation.

The State Chancellery of Northrhine-Westphalia proposes the introduction of a new concept relating to “user surface”; it is to encompass overviews of broadcasting services helping users to orientate themselves and permitting the direct choice of an offer. Surfaces under this definition must not differentiate between comparable broadcasting services as regards the sorting, listing or presentation of content available. In addition, all services must be classified using a search function which allows content to be found in a non-discriminatory fashion. Furthermore, the criteria adopted for sorting services must be made public.

The practical application of this proposal would result in an extension of the regulatory framework. It would no longer be restricted to user surfaces of cable network operators only, but would also cover the navigation surfaces developed by the manufacturers of smart TV sets and settop boxes while proprietary media libraries of broadcasters and overviews available via social networking sites or search engines would continue to remain outside the regulatory regime.
Critical reaction of the industry
The extension proposed for the regulatory framework was mostly met with a critical response by the industry. For the internet providers, the proposals go too far as the industry does not see any need for regulation, arguing that providers of user surfaces intending to offer an attractive navigation service to their customers could not risk discriminating against individual services, let alone excluding them from the navigation. Players in the electronics and technology sectors tabled similar arguments, claiming that there was no risk for the plurality of opinion since free choice for users increases thanks to user surfaces and above all, through app portals. A similar position is held by the cable network operators who worry about the impact on their competitiveness, should additional, stricter regulation come into force.

The position of the media authorities
The media authorities by contrast have been advocating an extension of the provisions governing the regulation of user services so that they also cover manufacturers of smart TV sets and settop boxes. After all, for safeguarding the plurality of opinions and offers it does not make any difference whether users are guided to broadcasting services via a user surface operated by a manufacturer or a network operator. Practical experience has also provided proof of the need for regulation: Many user surfaces of smart TV sets are supplied with a default channel setting that defies any clear logic.

The German media authorities therefore welcome the autonomous concept for user surfaces proposed by the State Chancellery of Northrhine-Westphalia, and also approve the inherent expansion of the regulatory regime, in particular as the concept extends the legal relevance of balanced findability into a regulatory objective. To date, user surfaces are legally covered only as an “annexe” to free technical access.

However, in the view of the media authorities, the legal implications of the concept require some clarification. The media authorities recommend a legal minimum requirement specifying that all available services must in fact be shown by user surfaces. Search functions, on the other hand, continue to be optional; where they are provided, however, results must be non-discriminatory.

Privilege for public-value content
In the debate on the findability of offers, an important aspect to be considered is the issue whether offers providing a special contribution to the plurality of opinions (so-called “public-value offers”) must be granted special privileges concerning their being found in the design of a user surface. Put another way: Is there a need for positive discrimination within the user navigation for ensuring the plurality of offers and opinions? Views on this question are also widely divided among the players of the market.

For the public-service broadcasters, privileged findability of public-service offers is justified not only due to their special contribution to the formation of opinion, but also considered to present a requirement under the German Constitution. The cable network operators, by contrast, cast doubt on such a privilege considering it questionable under the Constitution. They point to the disadvantages ensuing for other providers as a result of such positive discrimination. Furthermore, they also raise the question in which procedure and by whom such a “seal of public-value” could be granted. In daily practice, content which is relevant for the formation of opinion is always placed on user surfaces in such a way that it is easy to find, they argue.
By contrast, the association of commercial broadcasting and telemedia providers (VPRT) welcomes privileges benefitting the findability of public-value content on principle. Services contributing to the plurality of opinion in a specific way by voluntarily offering public-value content should at least benefit from a preferential presentation on user surfaces. In addition, privileges could be granted to service providers targeting specific groups of users, for example thematic channels focusing on information. In this context, an incentive-based regulation could be introduced which could be further detailed by defining content categories that might be considered relevant.

The procedural approach of the media authorities

The German media authorities also endorse public-value offers being granted privileges. After all, such offers can only fulfil their purpose if they do in fact come to the attention of the users and do not disappear in the mass of offers available. With fundamental rights being at stake, the necessary regulation requires careful fine-tuning.

In the view of the media authorities, individual key characteristics defining public-value offers including how they should be rated could be laid down in a catalogue at the level of the Interstate Broadcasting Treaty. Whether individual services qualify as public-value content could be determined by the media authorities in a process of selection. This procedural approach only requires legal definitions concerning the standards to be applied for the selection, the maximum number of offers to be qualified, and the duration of the selection taken. How providers of user surfaces thereafter ensure that the selected offers gain privileged findability should be left to them.

This procedural approach on the one hand provides flexibility; on the other hand it attributes the task of qualifying which services are of special relevance for the formation of opinion to the neutral media authorities. Having already dealt with the allocation of cable capacities and capacity assignments, the media authorities have already gathered the expertise required for conducting such selection procedures.

The media authorities are also developing an approach for establishing concrete criteria for differentiating public-value offers from other content. These might include considering news content, the amount of information programmes or the number of own productions contained in a service. As another possible approach, input-oriented factors might be taken into consideration as far as it can be assumed that providers who maintain certain standards concerning the qualification, training and payment of their staff might generally set and meet higher quality standards. Under certain circumstances, these matters might be made subject to statutory regulation through the media authorities. This does, however, still require some further debate.

General services – the approach of the State Chancellery of Northrhine-Westphalia

The above-mentioned issues have already been dealt with in the proposals presented by the State Chancellery of Northrhine-Westphalia. The State Chancellery proposes an approach under which the selection of public-value offers to be privileged should cover the public-service channels defined by the Interstate Broadcasting Treaty, and should otherwise be geared along the licences granted for general services or thematic channels focusing on information. Under this approach, there would be no need for a selection procedure.
Irrespective of differing positions on detail prevailing in the market, this approach has been met with almost unilateral criticism regarding the practical problems ensuing in its implementation. ANGA, the Association of German Cable Operators, is concerned that this strategy would require not only German-licensed general channels to be taken into consideration, but also similar services coming from elsewhere in Europe. This would result in such a large number of services to be privileged that it would effectively undermine their being found easily. Public-service broadcaster ZDF opts for the must-carry status for orientation rather than the status of a general channel in order to achieve some balance.

The media authorities, too, consider this aspect of the proposal of the State Chancellery of Northrhine-Westphalia presented to be problematic overall. Disregarding the fact that the approach offers only little flexibility, it would not yield an adequate result as licensing a channel as a general service will not in itself already be linked to added value for society through the service in question. Furthermore, a considerable number of services currently hold a licence as a general channel or a thematic channel focusing on information. It appears hardly likely that all these offers can effectively be privileged.

**Bone of contention: ban on alterations and marketing**

Finding audiovisual content is affected more and more by recommendation systems available on smart TV sets, offering additional information on a programme or service, and pointing to potentially interesting content using algorithms. In addition, the smart TV set is also becoming the lynchpin as regards the exchange of social media feeds or news. These additional functions are mostly effected using fade-ins (overlays) in the service that is watched at the time.

This would contradict the proposal presented by the State Chancellery of Northrhine-Westphalia according to which the prohibition of changes to a service and its marketing should be revised, excluding not only any alteration of the content in question and the technical distribution of a service, but also graphic fade-ins (overlays) and size adjustments carried out without the approval of the broadcaster, in the future. The ban would not cover overlays and size variations which may have been authorized by the user for each individual case.

A large number of cable network operators voiced criticism regarding this proposal of the State Chancellery; it would imply the loss of scope for economic activities, apart from insufficiently taking into consideration the convergence of the internet and broadcasting. A similar assessment comes from the electronics industry which in qualifying its view states that whereas it would be proportionate to link amendments to users approving them, this would apply only insofar as a general approval of overlays should be sufficient. VPRT, by contrast, welcomes the extension of the ban of alterations but sees this largely in the context of overlays over advertising content. The audience reach of a channel which is also achieved through financial investments must not be abused by third parties for their own advertising purposes, it is argued.

The media authorities have adopted a mediating viewpoint: In their opinion, overlays and size variations should be made subject to the approval of the content provider or the user in order to take account of the sovereignty of the provider regarding his content and the autonomy of the user, and their respective interests; however, the media
authorities are also aware that it is unrealistic to expect users to opt in prior to each overlay in practice. The autonomy of the user is also sufficiently warranted if users grant an informed approval in advance in the default setting. This, however, requires full and comprehensive information.

“Media platforms” as the route to the future
The presentation of the present debate has made one thing clear: Many issues relating to platform regulation currently concern the questions of findability of content. This should not, however, hide the fact that access regulation also needs some amendment to account for the convergence of the media these days.

The cause for this need is a new competition scenario among the media. Users have more and more options for accessing audiovisual content at their disposal. The traditional transmission infrastructures, i.e. cable, satellite and terrestrial, are now complemented by IPTV offers such as waipu.tv. In addition, over-the-top (OTT) offers are gaining in relevance. Providers like Zattoo, TV Spielfilm live or Magine TV supply access to broadcasting services via the open internet for millions of viewers at times without operating the infrastructure required for this service. Video-on-demand offers including Netflix or Amazon Prime are gaining in significance especially among younger users, and not least, convergent platforms such as advanceTV, Horizon or GigaTV are entering the market.

The current Interstate Broadcasting Treaty no longer fits this changed situation of the market. The provisions for platform regulation in force today mainly address the traditional routes of transmission and are linked to the operation of infrastructures. OTT providers in the “open internet” are covered only fleetingly, and only as regards a dominant position in the market.

The proposal of the State Chancellery of Northrhine-Westphalia presented for debate seeks to address this situation by introducing the future-oriented concept of the “media platform”. This is to comprise all services combining broadcasting or telemedia content resembling broadcasting offers. In contrast to the present regulation, this would also encompass (media) platforms in closed systems by definition in a technology-neutral fashion. This would – rightly – allow for the identical regulation of the traditional distribution platforms and new (media) platforms.

For the first time, broadcasting legislation would also address apps on the homescreen as these are to be covered by the concept of media platforms to the degree that these smart TV portals permit access to linear broadcasting services. This, too, appears only logical with a view to regulating plurality. However, apps in such smart TV portals usually serve the purpose of providing an overview of offers available. In the opinion of the media authorities, they should therefore be attributed to the concept of user surfaces.

The media authorities rate the proposal of the State Chancellery of Northrhine-Westphalia overall as a positive approach for amending the regulation in force, in particular since it distinguishes access regulation from regulating findability. As regards the interests of the content providers, the various phenomena should be dealt with separately from each other as clearly as possibly; this applies to intermediaries in particular. The media authorities therefore consider it the right strategy to exclude search engines in the internet and social media such as YouTube from regulation in the media platform concept.
On the home straight ...

The paper of the State Chancellery of Northrhine-Westphalia presents regulatory proposals that deserve approval in many respects. The process of amending the legislation in force should now be pursued and completed stringently. The large number of adjusting tools allowing for exerting influence in the framework of the regulation of access and findability in this respect allows for a finely-tuned, adequate and proportionate regulation of the distribution of television. Having such a well-filled toolbox to hand and having conducted such a comprehensive consultation with all players, there is no reason to wait any longer with putting the amendments into force – on the contrary: Time is of the essence as convergent media platforms will increasingly dominate the markets and shape media consumption. It is to be hoped therefore that concrete amendments of the Interstate Broadcasting Treaty will provide an answer to the converging world of the media without further delay.
Digitisation in Germany: facts and figures
Part I: Digitalisation of television infrastructures

Years of status reports, affirmations and waiting have led some observers to equate the advent of full digitalisation of television reception with the arrival of Beckett’s Godot. But unlike that never-to-materialize character so desperately awaited by tramps Estragon and Vladimir, the digitalisation of cable will come – of this the protagonists are convinced and have therefore stopped idling away the time – after all, exclusive digital television reception via cable, and thus of all German television households, is taking shape, and the light at the end of the tunnel is coming nearer. As can be seen from the data shown in the present report on digitisation which was once again conducted in the framework of the annual research programme of the German media authorities, full digitisation is approaching in big steps. All players involved in this process are getting ready to steer it on the right course.

But not only that: Digital terrestrial television this year saw the start of a switchover process which was also guided by the media authorities. The study therefore includes data for terrestrial reception via the new DTT2 HD standard for the first time. And the next switchover process is also already looming on the horizon: Television in the majority of households is not only enjoyed as digital reception, but already also as high-definition television (HDTV). As the study shows, HDTV is growing at an ever-faster pace, and that will raise the question concerning an exit from digital simulcasting and/or SD television transmission in the not-so-distant future.

For the 13th time in succession, the media authorities are presenting their report on digitisation which illustrates the facts and figures concerning the status of the television infrastructures converting to digital signals. As has been the tradition to date, the data are based on a representative survey of the population conducted in the early summer of 2017 by Kantar TNS (formerly TNS Infratest). The study not only provides the current data for digital television reception, but also highlights the relevance of end devices and offers such as smart TV, smartphones, tablets, live streaming, video on demand or second screen use by individual users relating to the consumption of
digital video (see Part II: consumption of digital moving images).

**Passing the 90 per cent mark for the first time – full digitisation in sight**

At present, fewer than each twentieth household in Germany still resorts to analogue signals for television reception; the number of analogue-only homes now totals around 1.8 million (Fig. 1). The figure went down by more than one million over the last year; digital TV households, on the other hand, experienced an increase to 36.5 million including 1.4 million households still receiving analogue signals alongside digital reception, e.g. via the second set. Counting these homes as digital households, the rate of digitisation of television reception has risen to 93.5 per cent. The rate of digital-only households has also passed the 90 per cent mark and now stands at 91.7 per cent; full digitisation is thus within sight.

**Few only still consuming analogue TV signals requiring high bandwidths**

A small number of analogue or partly analogue households in Germany remains that features cable reception; cable is the only infrastructure which still offers analogue television signals by analogising the transmission signals that have been provided by the television broadcasters as digital-only technology since 2012. This results in a considerable share of the available bandwidth being taken up for analogue simulcasting, thus blocking it for HDTV or broadband internet offers.

The share of cable households using analogue television signals has been decreasing year by year while in return, the number of digital cable homes experienced a marked increase to 88.6 per cent nationally at present, bringing the rise within the last year to 6.5 percentage points.

The 80 per cent threshold had already been passed last year. When this threshold was reached in earlier switchover processes, a switch-off date was determined and concrete planning and accompanying measures were initiated. For cable, the situation, however, is far more complicated than for the other infrastructures. This became evident during the “Round Table” process involving the cable network providers and the broadcasters which has been moderated by the media authorities since the summer of 2016. A particular problem is presented by the fact that there are no similarities in the initial situations and the plans of the various cable network operators differ. Furthermore, there is the housing industry with its special interests to consider which is also sitting at the table. These diverging interests might make a uniform national switch-off date for analogue cable reception impossible to achieve; the players are, however, agreed on ending analogue signal transmission in almost all networks by the end of 2018, and on organising this switchover as user-friendly as possible.

**Opening the door to 21st century television for 11.4 per cent of cable households**

At present, the switch-off of analogue television reception would directly concern 11.4 per cent of cable households or around 1.8 million homes. With these homes resorting to the reception of analogue television via cable only, the current data indicate that another 1.4 million television homes receive analogue television signals via at least one set in the household. Including these homes, a national switch-off of analogue cable transmission would currently affect just under 18.1 per cent of cable households. In reverse conclusion, four out of five cable households would not even notice any change at present.
Fig. 1:

Status of transmission platform digitisation

analogue reception only: 1,783 mio. television households

digital and analogue reception: 1,392 mio. television households

digital reception only: 35,132 mio. television households

Source: Kantar TNS; Basis 2017: 38.306 million television households in Germany

16,843 / 17,320 / 17,624 / 17,779 / 18,079 / 17,687 / 17,502 million satellite television households in Germany
The number of households which are fully or at least partly affected comes to 3.2 million; this indicates that extensive communication measures are required until the end of 2018 to ensure that the switchover to digital-only television reception in close to all cable networks is organised as consumer-friendly as possible. This is a challenge for all players involved: the cable network providers, the television broadcasters and the housing industry. With the media authorities moderating the process as they successfully did in the previous switch-off and switchover procedures, it will be possible for all parties to act in concert and jointly pursue the objective of opening the door to the television of the 21st century for the remaining analogue-only television households.

Unitymedia going ahead, regional differences regarding digitisation growing

Proof of this strategy turning into a success is provided by the example of cable network operator Unitymedia, the second-largest cable network operator in Germany. In the early summer of this year, Unitymedia switched off analogue television distribution in the cable networks in Baden-Wuerttemberg, Hesse and Northrhine-Westphalia.

There are clear regional differences concerning the rate of digitisation of cable reception. Unitymedia switched off analogue television transmission successively from the south of Baden-Wuerttemberg to Hesse while the data for the report on digitisation were being collected, whereas the switch-off in Northrhine-Westphalia was effected only after the survey had ended. But even despite this fact, these German states show the highest rate of digitisation by far. Northrhine-Westphalia can pride itself with a rate of more than 94 per cent while Baden-Wuerttemberg narrowly leads Hesse at 92.5 per cent. Most other German states feature comparatively similar rates of digital cable television reception ranging from 87.7 per cent to 85 per cent with only Bavaria and Brandenburg lagging somewhat behind. Whereas Bavaria managed to crack the 80 per cent threshold with presently 82.8 per cent of digital cable, Brandenburg as the last state narrowly misses it at 79.8 per cent. The gap between the top and the bottom of the cable digitisation league has continued to widen to 14.4 percentage points at present.

The same applies to the differences between the major cable network operators: During the survey period, Unitymedia held the lead with 95.6 per cent of digital television households, confirming last year’s top rank. With the last stage of analogue cable switchoff in the networks in Northrhine-Westphalia completed at the end of June of this year, the cable households supplied by Unitymedia are all fully digital at the publication of this report. Marked progress can also be deducted from the results of the survey for cable network operator Tele Columbus which expanded in recent years through acquiring other operators. By June of this year, the number of households supplied with digital cable television by Tele Columbus had grown to an above-average rate of 92.3 per cent while the rate of digitisation in the homes supplied by the largest German cable network operator, Vodafone Kabel Deutschland, is still below average at just 86.5 per cent of homes receiving digital cable television content.

Analogue cable households in need of new end devices and support

The different rates of digitisation that are evident both regarding the switchover by regions and by cable operators illuminate that the tasks to be fulfilled to achieve full digitisation by the end of 2018 are not spread evenly. Regarding communi-
cation measures in particular, some regions and some cable network operators will need to intensify their information efforts regarding the benefits of digital television and the impending switch-off of analogue cable transmission to be supplied. In this respect, all data concerning the households that receive television via analogue cable only may come in useful.

A mere 4.4 per cent of the households watching only analogue cable television state that they own an HDTV set. Some 28.0 per cent are, however, unaware whether their television set is an HD-ready device. By comparison: Some 74.7 per cent of all television households at present have at least one HDTV set at their disposal, and only 9.4 per cent of them are not aware of this fact. This shows that in the large majority of the analogue cable households no new television set has been acquired for some time and that a new end device will be needed when analogue cable transmission is switched off, be it a new television set with an integrated DVB-C receiver or an external digital receiver. The data at the same time indicate that the remaining analogue television households feature a below-average affinity to technology and may require special support to make their way into the world of digital television.

Less purchasing power, fewer people working
A look at the net income of the households resorting to analogue cable television only shows that the income at less than EUR 1,900 per month is clearly below that available in digital cable homes (EUR 2,550) and even further trails that of all television households which can spend just under EUR 2,700 per month. In addition, the 23.5 per cent share of analogue-only cable households with a monthly net income of less than EUR 1,000 is more than twice as high as among the digital cable households and television households overall.

As regards the age, gender and (professional) activity of the person earning the income of a household, the differences between analogue-only cable households and the television households overall are far less pronounced. At an age of 56 years, the average main earner in an analogue cable home is about three years older and at 44 per cent slightly more frequently female than in television households overall (39 per cent). Regarding work, the differences are somewhat greater: While 52.4 per cent of the main income earners in analogue-only cable households work full time or part-time, this applies to 62 per cent of main earners in television households overall.

Mostly no direct television contract
A look at the contract situation of the analogue-only cable television households reveals that the picture that emerged over the last years has practically not changed at all. Around 59 per cent of these households do not have a direct contract with the cable network operator supplying the television signals, but instead are billed by their landlords in the settlement of the ancillary costs to be paid by the tenant. For these 896,000 analogue-only cable households, the landlords and in particular the housing industry need to act. For full digitisation to be completed by 2018 in a consumer-friendly fashion, the housing industry in particular has to be prepared to support the process and to lend help to the tenants during the switchover process.

Cable and satellite head-to-head in the lead, similar levels for terrestrial and IPTV
For the last five years, the distribution of the television infrastructures has remained almost un-
**Fig. 2:**

**Shares of the transmission platforms**

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<td>11.0</td>
<td>10.0</td>
<td>9.7</td>
<td>9.0</td>
<td>7.4</td>
</tr>
<tr>
<td>IPTV</td>
<td>3.0</td>
<td>4.3</td>
<td>4.9</td>
<td>4.8</td>
<td>6.2</td>
<td>6.9</td>
<td></td>
</tr>
</tbody>
</table>

Sum > 100 per cent due to multiple reception

Source: Kantar TNS; Basis: 37.668 / 37.977 / 38.157 / 38.557 / 38.899 / 38.076 / 38.306 million television households in Germany
changed. The data collected in this year’s survey by Kantar TNS show a clear lead for cable and satellite which both feature an identical audience reach.

As was the case already last year, 45.9 per cent of the German television households receive television via a cable connection while satellite reception at 45.7 per cent is virtually on par (Fig. 2). This corresponds to 17.6 million cable households and 17.5 million satellite homes in Germany.

After the start of the switchover procedure to the new DTT2 HD standard in late March of this year, a smaller percentage of the German television households resort to terrestrial television reception, but at 7.4 per cent, this still constitutes a sizeable share of homes. Close to three quarters of the terrestrial households already receive DTT2 HD television; this corresponds to 5.5 per cent of television households overall.

Due to the loss in audience reach of terrestrial television (down 1.6 percentage points) and a simultaneous increase of 0.7 percentage points, IPTV at 6.9 per cent of German television households has almost caught up with terrestrial television. For the second year in succession, IPTV thus presents the only transmission infrastructure increasing its technical reach. Put in absolute figures, terrestrial television (2.8 million households) still leads IPTV (2.6 million homes), but a look at reception via the main television set which is mostly used in the sitting room shows that with 2.5 million households, IPTV has already moved ahead of terrestrial television (2.2 million homes).

More households reached in the core regions with 2.2 million receiving terrestrial television
Terrestrial television traditionally enjoys particularly great popularity in regions where both public-service television and commercial offers are transmitted. In the DDT2 HD switchover process, these so-called core regions were extended or new regions added. Following the expansion, the terrestrial core regions now comprise 19.1 million television households; this is an increase of some 4 million compared to last year. At present, 11.7 per cent of the television households in the core region watch terrestrial television; this corresponds to well over 2.2 million households.

Switchover to DTT2 HD – Round Table and project office
The switchover to DTT2 HD is carried out in a stricter fashion than the digital switchover of cable transmission or the digitisation of satellite reception which was completed in 2012 after several years of simulcast transmissions permitting households to gear up to digital reception bit by bit. The planned re-allocation of the terrestrial capacities which are to be used by the mobile industry implied that such an extended simulcast period of terrestrial television was not possible.

In the core regions, the simulcast prior to the switchover at the end of March 2017 only lasted around nine months. In addition, simulcasting was limited insofar as only a very small bouquet of services was initially available in the new DTT2 HD standard.

Preparing the switchover therefore was and is all the more important. The media authorities involved all important players, including public-service and commercial television broadcasters and the operator of the new freenet TV platform in their Round Table discussions. The talks were conducted in agreement with the Federal Cartel Office; they commenced in summer 2014 for coordinating the technical switchover process and, above all, the communication measures going
along with it. The Round Table and the project office which was specifically set up for this purpose also served the exchange of views with the receiver manufacturers and the wholesale and retail trades. Following the definition of the new standard, it was necessary to ensure that end devices were available in all price ranges and that the users of terrestrial television were informed in a technology-neutral fashion about the impending switch-off of the signal transmitted in the former DTT1 standard which necessitated technical measures; these usually comprised the purchase of a new receiver.

Information overlays on TV most important, DTT2 homes mostly feeling well informed
A very effective means for reaching viewers is television itself; this is underlined by the data surveyed by Kantar TNS during May and June of this year. Some 2.1 million households changed to DTT2 HD; of these, 69 per cent stated that they had been informed of the impending switch-over via television. Well over half – i.e. the largest share of the households switching by far – were informed by means of an information overlay during a programme while just under 30 per cent learnt about the switch-over through an item in the news on television or through a report on it. Television advertising for the new platform freenet TV or a competing television offer made some 22 per cent of households realise that a switch-over would be coming while teletext or videotext presented the source of information for 12 per cent.

Newspapers and magazines present another important source of information: Around one third (34 per cent) of the households resorting to DTT2 HD reception stated that they had (also) been informed via this outlet. Friends and acquaintances (24 per cent), the internet (23 per cent) and radio reports or promotion on the radio (22 per cent) roughly matched each other as regards the sources of information. Compared to hearsay among friends and acquaintances, the communication via the social networking sites was of minor relevance only: A mere 4.4 per cent of the DTT2 HD households found the information on the switchover via Facebook, Twitter & Co. Posters (16 per cent), retailer information (16 per cent) and direct mail actions (12 per cent) proved more effective as means of information.

Many of the households switching over stated that they received the information via two or more sources, and close to 60 per cent of the DTT2 HD homes considered the information provided on the switchover process to be very good or good. Some 16 per cent of the households felt that they were less well informed, but only 9 per cent thought they had not been informed well at all.

One quarter opting for terrestrial reception of commercial channels against pay
The commercial services transmitted via DTT2 are transmitted almost exclusively in the HD standard. Unlike for the other transmission infrastructures, no digital or SD simulcast through the air is offered. The DTT2 HD households stated that they had also been well informed of the fact that reception of the commercial services via DTT2 HD would become subject to payment following the end of the three-month period during which they were offered free of charge. A large majority (70 per cent) of households was aware of this fact already prior to participating in the survey conducted on behalf of the media authorities, but only close to 26 per cent stated that they had already subscribed to the new pay offer on the platform or that they are planning to take out a
subscription; a little under 20 per cent had not yet decided whether they would do so. Well over half of the participants of the survey, however, declared that they would not want to receive the commercial services via DTT2 HD in the future; just under 36 per cent of the DTT2 HD households intend to forego commercial television content altogether while 21 per cent plan to watch commercial television via another infrastructure or the internet.

**HDTV continuing its success story, also thanks to the new HD terrestrial standard**

The success story of HDTV opens a new chapter this year: Technical reception potential currently is around 75 per cent; this means that three quarters of all television households in Germany have at least one HD-ready receiver at their disposal.

The greatest HD potential can be found in the IPTV households of which more than 90 per cent already own at least one HDTV set. The terrestrial households rank second at 87 per cent of HDTV receivers; the rate of DTT2 HD households with an HD-ready television set is as high as 97 per cent. In satellite households, around 76 per cent have an HDTV receiver at home while in cable households, the rate is 71 per cent.

Presently, 65.7 per cent of the television households state that they are receiving television con-

---

**Fig. 3: HD reception and commercial HD offers**

| HD reception | 65.7 + 23.7 | 83.4 + 17.0 |
|             | 67.2 + 6.2  | 58.3 + 27.6 |
|             | 69.6        |             |

| commercial HD offers | 28.2 + 42.4 | 58.8 + 89.1 |
|                     | 17.8 - 8.2  |             |
|                     | 29.0 + 47.2 |             |
|                     | 45.3        |             |

0% 25% 50% 75% 100%

[all TV households] [IPTV] [satellite] [cable] [terrestrial] [change over previous year (in per cent)]

Source: Kantar TNS; Basis: 38.306 million television households; 17.564 million cable households; 17.502 million satellite households; 2.840 terrestrial households; 2.640 Mio. IPTV households
tent in HD quality; this means that apart from an HDTV set, they also have a suitable HD receiver (internal or external set) at their disposal (Fig. 3). This constitutes a clear increase by just under 24 per cent over last year. Within the last 12 months 5 million more households in Germany therefore watch television offers in HD quality. The analysis of the individual levels of reception reveals a similar picture for HD reception and for HDTV equipment available in a household: Of the IPTV households, 83.4 per cent consume HD television; for the terrestrial households, television consumption in HD quality has reached 69.6 per cent while in satellite households the rate is 67.2 per cent, in the cable households it is 58.3 per cent. Growth among IPTV and cable households is more or less similar to that for television households overall. Since terrestrial households have been able to receive high-definition television through the air for the first time since the spring of this year, this provides a considerable contribution to the overall success of HD.

Commercials gaining in acceptance via HD, but not via satellite
Watching commercial television services in the HD standard is possible only against (additional) pay; this applies not only to DTT2 HD, but to all routes of transmission. As a result, reception of commercial HD offers developed at a clearly slower rate in recent years than was the case regarding HD in the general trend. Of the television households surveyed, around 28 per cent stated that they receive commercial HD channels; this is clearly more than last year, bringing the rate of commercial HD reception up by 40 per cent within one year. The 10.7 million commercial HD households included a large number of DTT2 HD homes during the period of the survey that did not yet have to pay for the reception of commercial HD offers. The rate of terrestrial households watching television in the HD standard reached 45 per cent with the switchover. Growth of HD reception can, however, also be noted when looking at the data relating to cable and IPTV: As many as 59 per cent of the IPTV households already receive commercial HD offers (up 28 percentage points) while the rate is even larger for cable where it comes to almost a third (29 per cent, increase 9 percentage points). Only the satellite households are stagnating at 18 per cent of commercial HD reception.

HD important purchase argument: nearly 3 million planning to buy a new TV set
It is to be expected that the trend going towards HD will persist. Presently, some 71 per cent of the households state that they are planning to acquire a new television set; of these, 71 per cent simply want to replace the existing television set by a new receiver. More than half (56 per cent) would like to have a larger screen and almost half (49 per cent) of those questioned during the survey stated that HD reception was the motive for acquiring a new set.

Ultra HD still in the starting blocks, but already a key argument for acquiring a new set
Close to one third of the viewers intending to buy a new television set stated that this is motivated by Ultra HD or 4K reception. Providers of satellite television in particular consider that Ultra HD or 4K offers potential for growth, and awareness of the technology which is still fairly new, continues to rise. The designated successor technology of HDTV is a familiar term for just under 57 per cent of the television households surveyed, and the number of TV households stating that they own an Ultra HD-ready television set has almost doubled to 6.1 per cent compared to last year. Despite
the fact that the range of offers available as Ultra HD content is still quite limited, the image quality continues to top the list of reasons guiding the purchase of a new television set. It can be foreseen that further technical switchovers will follow once the digitisation of television reception and the introduction of HD have been completed.

Share of “smart” television households up by 25 per cent

“Smart TV” is the motive that gained most in the list of the reasons for buying a new television set by far, and has already reached 4th place among the reasons named for acquiring a new receiver at 39 per cent. Most consumer electronics shops nowadays hardly offer television sets on their shelves any longer that do not provide internet connectivity as a feature. Currently, 31.9 per cent of the television households are aware that they have at least one smart TV set at their disposal; the rate has thus doubled within three years. In addition, the share of television households that in fact connect their smart TV receiver to the internet is also on the rise: The rate of “smart” television households currently stands at 22 per cent; this constitutes an increase of 25 per cent compared to last year.

Connected TV overtaking cable and satellite as “reception infrastructure”

Disregarding genuine smart TV sets, television receivers can be converted to provide connected TV also by means of various peripheral devices such as internet-ready games consoles, Blu-ray players, settop boxes or streaming boxes or sticks. When also counting peripheral devices, 32 per cent of

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Fig. 4: Connected TV – connected to the internet

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
<th>Change (in %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available</td>
<td>50.1</td>
<td>+1.8</td>
</tr>
<tr>
<td>Connected to the internet (and TV set)</td>
<td>46.8</td>
<td>+3.8</td>
</tr>
<tr>
<td>Smart TV set</td>
<td>32.0</td>
<td>+16.8</td>
</tr>
<tr>
<td>Connected TV (incl. games consoles, Blu-ray players, hybrid/streaming boxes/sticks)</td>
<td>22.0</td>
<td>+25.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>[%]</th>
<th>[Net total connectable TV (incl. PCs/laptops, tablets &amp; smartphones)]</th>
<th>[Net total connected TV (incl. games consoles, Blu-ray players, hybrid/streaming boxes/sticks)]</th>
<th>[smart TV set]</th>
<th>[change over previous year (in per cent)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>50.1</td>
<td>46.8</td>
<td>32.0</td>
<td>+1.8</td>
</tr>
<tr>
<td>10%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20%</td>
<td></td>
<td></td>
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<td>30%</td>
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</tr>
<tr>
<td>60%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Kantar TNS; Basis: 38 306 television households in Germany
the television households have a connected TV at their disposal. Taking into account PCs, laptops, tablets and smartphones (connected to the television set) alongside the smart TV set and peripheral devices, the share of connected TV households reaches 46.8 per cent. Stated in absolute figures, close to 18 million households in Germany have connected at least one television receiver to the internet. This puts connected TV as a reception infrastructure which is available at the television set in first place for the first time, ahead of the traditional infrastructures cable and satellite.

Part II: Consumption of digital moving images

For a long time already, the consumption of digital moving images has been a lot more than “classical television” transmitted via satellite, cable, through the air or via DSL or fibre optics cable in the form of quality-protected IPTV. In the open internet, i.e. over-the-top (OTT), television content is consumed via live streaming, or watched via a media library as time-shifted consumption; video on demand offers (VOD) are accessed via online video libraries, video portals or via social networ-
king sites. This could almost lead to the impression that the internet has become the most important digital mode of reception. But this is not (yet) the case, at least not as far as the large majority of society aged 30 years or older is concerned. For younger consumers, however, the consumption of digital moving images mostly concerns the use of the internet, and the television set tends to become less relevant.

**TV set no longer unchallenged, but still the most important device for consuming moving images**

When questioned which is the most important screen available in general, 33.3 per cent of persons aged 14 years or older state that this is the television set (Fig. 5), which thus very narrowly leads the smartphone (32.5 per cent) while the laptop (12.2 per cent), PC/desktop (11.8 per cent) and tablet (4.2 per cent) trail far behind. Within a period of a mere three years, the smartphone has thus almost fully made up the lead of more than 20 percentage points held by the television set to date.

Younger users favour the smartphone which has overtaken the time-honoured “telly” quite clearly; the group now also comprises viewers in the age group 40–49 years. Consumers aged between 14 and 29 years do not attribute any specific relevance to the television set at all but consider the PC/desktop or the laptop to be more important alongside their smartphone. A mere 3 per cent of those aged between 14 and 29 years stated that the television set is their most important screen device.

As regards the consumption of moving images, however, the TV set still remains the most important receiver by far: A large majority (63.4 per cent) would find it hardest to do without the television

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**Fig. 6:**

**Average share of consumption linear/non-linear (in per cent)**

<table>
<thead>
<tr>
<th></th>
<th>14+</th>
<th>14–29</th>
<th>30–49</th>
<th>50+</th>
</tr>
</thead>
<tbody>
<tr>
<td>traditional television (linear)</td>
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<td>38.3</td>
<td>64.9</td>
<td>84.7</td>
</tr>
<tr>
<td>VoD</td>
<td>17.9</td>
<td>44.0</td>
<td>20.2</td>
<td>5.4</td>
</tr>
<tr>
<td>personal recordings</td>
<td>6.6</td>
<td>6.3</td>
<td>8.2</td>
<td>5.8</td>
</tr>
<tr>
<td>Livestream</td>
<td>4.6</td>
<td>9.2</td>
<td>4.8</td>
<td>2.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>change over previous year (in per cent)</th>
</tr>
</thead>
</table>

Source: Kantar TNS; Basis: 69.563 million persons aged 14 years or older in Germany
set for consuming audiovisual content. Laptops (10 per cent), PC/desktop (8.3 per cent), smartphones (7.4 per cent) and tablets (4.5 per cent) are far less relevant in this scenario than applies in general, and even the age group 14–29 years has not completely given up the television set by any means as regards video consumption: Almost one third opts for the TV set. At least around one fifth each in this age group prefers the PC/desktop or the laptop respectively for watching moving images while only around 16 per cent use the smartphone for this purpose.

Traditional television still in the lead – but not among under-30s
Concerning the share of the consumption of moving images overall the answers provided by the participants of the survey revealed that around 69 per cent continue to consume traditional television services (Fig. 6). Compared to last year, this is a slight decline by 2 percentage points. The share of VOD consumption, on the other hand, has increased by 2 percentage points to 18 per cent for the average of the population overall. Similarly, the share of live streaming has also risen slightly, but at a rate of 5 per cent, live streaming in the overall consumption table is still topped by the share of content recorded by consumers themselves; the latter accounts for 7 per cent.

A look at the age group 14–29 reveals a rather different picture: For this age group, video on demand won first place with 44 per cent of video consumption overall, clearly overtaking classical television. The latter can only score 38 per cent in this younger age group in which the share of VOD went up by 20 per cent within the year while that of traditional television consumption went down by a similar amount during the same period. Live streaming also gained clearly in popularity among younger consumers and now holds a share of 9 per cent.

For consumers aged 40 years or more, the share of traditional television remained largely stable at an above-average high level. For the older age groups of consumers aged 60 years or more, traditional television continues to hold first rank in popularity and comes to a share of close to 90 per cent of video consumption overall while VOD and live streaming trail video use at a very limited share of less than 5 per cent.

OTT already main reception route for one fifth of the population
Looking at the source of video content differentiated by broadcast transmission infrastructures and the open internet and OTT respectively, OTT already features as the primary source for 20 per cent of the population aged 14 years or older. Around 75 per cent, however, continue to prefer traditional television and content they record themselves while 2 per cent of viewers divide their video consumption equally between the television transmission infrastructures and OTT. Compared to last year, OTT has added 2 percentage points. The average consumers focusing on live streaming and VOD tend to be around 31 years of age with the majority being male (61 per cent).

Young and male consumers primarily using non-linear in the majority
A similar scenario emerges in the analysis of linear versus non-linear consumption: As many as 19 per cent of the population already prefer the time-independent consumption of moving image offers on demand via the internet or as content they have recorded themselves. Traditional tele-
vision and live streaming are the preferred forms of consumption for 72 per cent while 6 per cent divide their consumption equally between non-linear and linear content. As a tendency, non-linear consumption is preferred, winning 3 percentage points compared to last year. At present, consumers primarily resorting to non-linear content resemble OTT users in being young (32 years on average) and the majority being male (56 per cent).

VOD by far most frequently used internet offer via the smart TV set
Looking at the television set as such, linear consumption continues to dominate the traditional routes of television reception. Far more than half of the population aged 14 years or older watch traditional television via the large screen every day or almost every day. However, the television set has for a long time already no longer been confined to the TV reception routes, but increasingly also permits access to internet offers (see Part I). In this scenario, VOD offers are gaining an increasingly greater share at the expense of other content distributed via the world-wide web.

In Germany, 16.1 million persons aged 14 years or older by now can access a smart TV set connected to the internet. Around 54.3 per cent of smart TV consumers access VOD offers directly via the TV set at least once a month. The share has thus gone up by almost 20 per cent within the last three years. Expressed in absolute figures, 8.7 million television viewers presently consume VOD content directly via their smart TV set; the figure is 6 million higher than in 2014. “Smart” television consumption is thus clearly led by VOD.

Information offers are accessed by 31 per cent of smart TV consumers; this is a clearly smaller rate compared to the overall figures. Some 23.4 per cent of consumers listen to the radio via their smart TV set at least once a month while live streaming directly via the smart TV set is a form of consumption for just 19.3 per cent of users considering that the traditional infrastructures continue to be available for linear television consumption via the smart TV set. Social networking sites play a clearly subordinate role concerning consumption via the smart TV set with only 8 per cent of consumers accessing Facebook, Instagram & Co. via the smart TV set once a month.

OTT consumption increasingly via the smartphone and the tablet
The tendency to consume video content via the internet is noticeable not only for the smart TV set. When analysing further options for indirectly supplying the television set with internet content (see Part I), 62 per cent of regular VOD consumers at present access such offers via connected TV. This corresponds to 15.6 million persons aged 14 years or older. While consumption via the PC or laptop continues to go down and presently stands at 55.6 per cent, consumption via the smartphone has now risen to 30.1 per cent and to 26 per cent via the tablet respectively at present. A similar move can be noted as regards regular live streaming consumption: Despite a downward trend, the PC and laptop at 63.6 per cent still lead connected TV (49.8 per cent), the smartphone (32.7 per cent) and the tablet (31.0 per cent).

Intensive consumption of VOD and live-streaming clearly on the up
The data reveal that the frequent consumption of OTT and/or VOD and live streaming offers in particular is clearly on the increase, irrespective of which end device is used for this activity. At least once a month, and thus almost regularly, 42.2 per
Current status of the digitisation of television infrastructures and television and video consumption in Germany

A cent of the population presently access OTT content; this is an increase of 9 per cent compared to last year. Close to one third (30.3 per cent) of viewers aged 14 years or older consume VOD and/or live streaming offers at least once a week. The share of weekly users has thus gone up by 17 per cent. The largest increase, however, can be noted at 22 per cent for consumers using these forms of consumption several times per week. Close to a quarter of the population (23 per cent) now already consume audiovisual OTT offers several times a week and thus in a comparatively intensive fashion. The group of heavy users therefore already comprises 16 million persons in Germany aged 14 years or older; it has grown by around 3 million within the last year.

Fig. 7:

**VOD content consumption**

<table>
<thead>
<tr>
<th>Source</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>YouTube/other video portals in total (net)</td>
<td>30.2</td>
</tr>
<tr>
<td>YouTube</td>
<td>29.5</td>
</tr>
<tr>
<td>media libraries of TV channels in total (net)</td>
<td>28.4</td>
</tr>
<tr>
<td>media libraries of public-service broadcasters</td>
<td>25.7</td>
</tr>
<tr>
<td>media libraries of commercial broadcasters</td>
<td>15.4</td>
</tr>
<tr>
<td>online video libraries in total (net)</td>
<td>15.4</td>
</tr>
<tr>
<td>Amazon Prime Video/Amazon Video</td>
<td>14.6</td>
</tr>
<tr>
<td>Netflix</td>
<td>11.0</td>
</tr>
<tr>
<td>iTunes</td>
<td>3.7</td>
</tr>
<tr>
<td>Maxdome</td>
<td>3.3</td>
</tr>
<tr>
<td>video content via social networking sites</td>
<td>11.9</td>
</tr>
<tr>
<td>TV platform providers (e.g. Sky, Unitymedia)</td>
<td>5.6</td>
</tr>
<tr>
<td>Twitch/other gaming video platforms</td>
<td>5.1</td>
</tr>
</tbody>
</table>

Source: Kantar TNS. Basis: 69.563 million persons aged 14 years or older in Germany, of which 25.083 million persons aged 14 years or older consuming VOD offers (professional content) at least once a month.
TV channels leading YouTube for live streaming
Content per live stream is not only offered by the television broadcasters, but also by YouTube, social networking sites such as Facebook, and by gaming video platforms such as Twitch.tv; individual streams, especially those of the television channels, are also provided by OTT platforms such as Zattoo or traditional television platform providers including Unitymedia or Sky which bundle and offer them as an overall package.

To a large extent, regular live streaming consumption focuses on the offers of the television broadcasters which are supplied directly, as well as on the offers available via YouTube. The TV channels are used by 13.3 per cent of the population overall, ahead of YouTube (11.5 per cent). 4.7 per cent of consumers enjoy live streaming via social networking sites, while the streaming offers of the television platform providers are used by 4.2 per cent of persons aged 14 years or older; Twitch.tv or other gaming video platforms are resorted to by 3.8 per cent while the user share for OTT platforms such as Zattoo or Magine totals only 2.7 per cent of the population.

Among younger consumers, YouTube has already beaten the television channels as regards live streaming, holding a share of 29.2 per cent compared to 23.5 per cent for the TV broadcasters. A similar picture emerges for Twitch.tv and other gaming video platforms which enjoy a clearly greater popularity among the 14-29 year-olds at 16.4 per cent than in the average population.

More than 20 million using YouTube for VOD, almost as many the media libraries
For video on demand consumption, the television channels must also allow YouTube to pass: Nearly one third of users (29.5 per cent) by now consume professional VOD content available on YouTube (Fig. 7). The media libraries of the public-service broadcasters and the commercial channels are accessed by an aggregated 28.4 per cent of consumers for this purpose. YouTube is currently resorted to by around 20.5 million persons aged 14 years or older in Germany; the media libraries are used by 19.7 million persons. The online video libraries offered by Amazon, Netflix & Co. have gained a share of 23 per cent of users (equivalent to 10 million persons) while 11.9 per cent of persons aged 14 years or more (equivalent to 8.3 million persons overall) consume videos available in social networking sites.

Amazon Video already on par with the media libraries of commercial TV
A close look at the data reveals that the media libraries offered by the public-service broadcasters clearly lead the media libraries of the commercial television providers with a share of 25.7 per cent of the population while the share for the latter comes to 15.4 per cent. As regards online video libraries, Amazon Video holds first place with 14.6 per cent, ahead of Netflix (11 per cent). These two libraries boast the largest growth by far: Compared to last year, Netflix gained 64 per cent while Amazon Video added 23 per cent. The absolute figures raised during the survey show that Amazon Video is regularly used for VOD consumption by around 10.2 million users at present; Netflix is the preferred VOD library for 7.6 million viewers. This means that Amazon Video, in particular, does not have to do a lot of catching up to the media libraries provided by the commercial channels (10.7 million users).

Among the younger consumers the commercial media libraries at 35.2 per cent clearly trail the public-service offers (45.3 per cent) while YouTube enjoys considerable popularity among the
age group 14–29 years: Some two thirds or 64.3 per cent of this age group use this Google video portal. Among younger consumers, the online video libraries are already more popular at 54.9 per cent than media libraries overall (53.8 per cent). Around one third each of this age group resorts to Amazon Video (33.2 per cent) or Netflix (31.9 per cent). Social networking sites are another source of online video consumption for many 14–29 year olds with 34.8 per cent accessing VOD content via Facebook & Co.

Online video libraries growing faster than media libraries in more intensive consumption
YouTube continues to unite the largest share of weekly consumers at 19.3 per cent of the population. However, looking at the more intensive consumption of pay offers, it becomes evident that public-service broadcasters and commercial television providers are now facing fierce competition from Amazon and Netflix: Around 8 per cent of consumers aged 14 years or older in Germany enjoy content provided by Amazon Video and Netflix at least once a week. The commercial media libraries cannot even gain half that rate at 4 per cent. While still presenting a higher share of 11 per cent of consumers using their offers at least once a week, the public-service media libraries, however, are expanding at a clearly slower rate of 16 per cent over last year when compared to Netflix (up by 97 per cent) and Amazon (plus 26 per cent).

Amazon and Netflix users young, consuming more VOD than traditional television
Consumers resorting to Amazon and Netflix are particularly young at an average age of 33 years (Amazon) or just 29 years respectively (Netflix). Around half of their video consumption is already focused on VOD (49 per cent in the case of Amazon, 56 per cent of Netflix users), while traditional television consumption takes up only one third of consumption (Amazon Video users 35 per cent, Netflix users 29 per cent). At the same time, this group of consumers is characterised by an above-average level of education and income. More than half of those resorting to Amazon Video have passed a university entrance degree or technical diploma (55 per cent) while among Netflix consumers, the figure is even higher at 59 per cent. Households consuming Amazon Video content have an average net income of EUR 3,548 per month at their disposal; for Netflix households, the monthly income averages EUR 3,250.

The VOD offers provided by iTunes and Maxdome have fallen far behind overall, but also among younger consumers and as regards intensive consumption. Their shares of consumers have dropped by 27 per cent each, now standing at 3.7 per cent and 3.3 per cent respectively of the population.

Manufacturers and platform providers steering content choice for more than a third of viewers
The selection of the content consumed by users is steered with the aid of algorithms which are employed by Amazon and Netflix as well as by YouTube and, to an increasing extent, the media libraries and the OTT platforms. The more frequently a consumer accesses an online video library, the more precisely the recommendation system employed can assess which content will match the preferences of the respective consumer.

In the world of traditional television which is still larger, channel listings continue to play the key role for a viewer selecting a content or service. In many sitting rooms, zapping is still a regular activity. Content that is not found among the first
10-15 services listed will thus have little chance of being discovered, and the top positions in the default channel listings pre-installed by the manufacturers in TV sets and settop boxes are accordingly sought after.

The race for the front places in the default listing is justified by the data: 40.6 per cent of viewers in digital television households have never yet changed the pre-installed channel listing of their television set or settop box (Fig. 8.). Alongside the channel listings, many television sets and settop boxes also offer the option of a so-called list of favourites permitting selected channels to be ranked for direct access. However, even fewer television viewers actually make use of the option of setting up a list of favourites: 74.8 per cent of the persons in digital television households, i.e. almost three quarters, have not set up a list of their favourite channels. 37.9 per cent have neither re-arranged the default channel listing nor set up a list of favourite stations. As a consequence, the pre-installed default listings of the manufacturers or the televisions platform providers exert quite a considerable influence on the selection of channels for 24.7 million television viewers.

**Smart TV portals more popular than Red Button/HbbTV**

As regards smart TV sets, the access to the channels is also organised by means of listings for channels and favourite services. The user surfaces of smart TV sets increasingly resemble those of smartphones and tablets: Smart TV sets and smart peripheral devices now feature tiles, apps and app stores. Access to the “smart” applications and content, i.e. those provided via the internet, in particular is organised via these surfaces that have copied the design of smartphones.

Similarly to the smartphone, home screens of smart TVs sets not only allow access to a specific content via the pre-installed apps or via apps the consumer has installed him- or herself, but also via a web browser and the URL. Unlike the smartphone, most smart TV sets now also offer HbbTV or a so-called Red Button function permitting the...
user to switch from the television content he or she is watching to the online offer of the respective content provider by pressing the Red Button on the remote control.

Users thus have three options for consuming VOD offers via the smart TV set: via the portal of the manufacturer, the web browser, or via HbbTV. As is the case for the channel listings, the ex-works applications and listings which are pre-installed or can be subsequently installed via the app store on the user surface will impact the content selected by the users.

The results of the survey confirm the developments that have emerged over recent years. The large majority of users resorting to a smart TV set, namely 69.2 per cent, access content via the user surface of the portal installed by the manufacturer (Fig. 9). Of these, 52.6 per cent resort to the selection put together by the manufacturer while 17.5 per cent subsequently also install further offers from the app store. Around one third (30 per cent) access internet offers via HbbTV or the Red Button. One fifth or 19.8 per cent use the browser available on the smart TV set for accessing offers and content. These results more or less match those of last year; only as regards apps, a continued tendency can be noted for a growing use of apps that have been installed by the user personally (plus 3.8 percentage points).

Just under half of television viewers using a second screen, mostly the smartphone

The comfortable size of the screen can be assumed to constitute the reason why the television set still leads all other devices as regards the consumption of moving images. However, for many consumers, the smartphone, tablet and/or laptop have turned into far more important companions in daily life, and these are often also used while the television set is turned on. Of the 677 million persons in German television households, nearly half (46.7 per cent) have turned into so-called second-screen users by now, and in the age group 14–29 years, the rate has already reached 76 per cent.

Fig. 9:

Direct consumption of internet content consumption via the smart TV set

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>69.2</td>
<td>via the smart TV portal (tiles or apps)</td>
</tr>
<tr>
<td>52.6</td>
<td>via personally installed apps in the portal</td>
</tr>
<tr>
<td>30.0</td>
<td>via portal in total (net)</td>
</tr>
<tr>
<td>17.5</td>
<td>via the “Red Button” / HbbTV</td>
</tr>
<tr>
<td>19.8</td>
<td>via the browser of the smart TV set</td>
</tr>
<tr>
<td>0%</td>
<td>change over previous year (in per cent)</td>
</tr>
</tbody>
</table>

Source: Kantar TNS; Basis: 16.132 million persons having access to a smart TV set connected to the internet; not specified: 16 per cent
As far as this use is concerned, a tendency pointing to an increased use of the second screen while watching television can be noted. At present, 18.2 per cent of second screen users already state that they use the second device more or less in parallel while watching television at all times; 56.4 per cent use the second device on occasion and only 25.4 per cent use it only rarely while watching TV.

The trend is therefore pointing not only to (frequent) second screen use, but also to the attention being focused stronger on the second rather than the first screen — in other words: Television is losing the attention of the viewers in this respect. The greatest proportion of viewers (37 per cent) state that when they use a second screen while watching TV, they tend to pay more attention to the second screen. For 26 per cent, attention is divided equally between the first and the second screen while for 35 per cent the first screen set remains the focus of attention despite the parallel use of a second screen.

At a percentage of 67 per cent and a continuing increase, the smartphone presents the second screen used by most viewers. Some 30 per cent of second screen users resort to the tablet while watching television and the same number use a laptop.

Most viewers use the second screen for individual communication. Around 84 per cent of viewers send mails, chat or use instant messaging services while watching television. For 60 per cent, the second screen serves searching up-to-date information and news in the internet while 52 per cent access social networking sites. Less popular uses via the second screen include e-commerce (35 per cent), content related to e-commerce (35 per cent), content related to a programme being watched (31.4 per cent) or online games (24.9 per cent).

The digital use of “moving images” is itself increasingly „on the move“. The older members of the population now watch television in digital and frequently high-definition standards, but the majority continues to resort to traditional or linear television — possibly unaware of what else their television set is able to offer. Younger viewers by contrast increasingly turn their backs on linear television and to a growing extent also on the offers of the television providers. They mosey around with YouTube, Netflix and Twitch.tv, and should they switch the TV set on, it is by no means certain that they will devote their attention to what is shown there.

With ever more new technical options, competition for the attention of the consumers in the digital world has never been fiercer than today. Offers that provide an enrichment for users may present a challenge for one or other provider of traditional television, be it a broadcaster or a platform provider — and does in fact already do so today.
Digital radio in the DAB+ transmission standard shows considerable rates of growth regarding a large number of relevant indicators of success. In the framework of the report on digitisation in Germany in 2017, the survey has once again established that the number of DAB+ receivers, DAB+ households and DAB+ consumption have gone up compared to last year. Further media policy milestones ensuring the future of digital radio have already been decided or are at least under debate. To sum up: The pioneering phase of digital radio is slowly, but surely coming to an end. Today already, there is no way any more to evade DAB+.

More and more households listen to the radio via DAB+

Continuously more German households are equipped with radio sets permitting reception of digital services in the DAB+ transmission standard. The rate of homes with such a receiver at their disposal and using it at least on occasion, has now risen to 15.1 per cent. The share of homes with a DAB+ set has thus more than trebled over the last five years. In 2013 the rate of German households owning such a receiver and listening to digital radio on a regular basis had been a mere 4.5 per cent.

More DAB+ households in every German state

Bavaria is the German state featuring the highest share of DAB+ households with a rate of 19.6 per cent, followed by Saxony (16.3 per cent) and Baden-Wuerttemberg (16.2 per cent). Compared to last year, the number of households with DAB+ reception has gone up in all states with Bavaria showing the largest increase from 15.0 per cent in 2016. Both Northrhine-Westphalia and Berlin-Brandenburg gained 2.6 percentage points and thus also experienced an above-average rise of DAB+ receiver equipment available.

Number of DAB+ radio clearly up both in the car and at home

Each DAB+ household is equipped with an average 1.7 DAB+ radio sets. In total, 9.9 million sets for digital radio reception via the DAB+ standard are now in use in Germany. A little more than one third are in-car sets, while just under two thirds can be found in the household, i.e. in private homes. The number of both types of DAB+
**Fig. 1:**

**DAB+ trends in the German states**

<table>
<thead>
<tr>
<th>Region</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>7.5</td>
<td>10.0</td>
<td>12.6</td>
<td>15.1</td>
</tr>
<tr>
<td>Bavaria</td>
<td>8.9</td>
<td>11.8</td>
<td>15.0</td>
<td>19.6</td>
</tr>
<tr>
<td>Baden-Wuerttemberg</td>
<td>7.3</td>
<td>14.0</td>
<td>14.5</td>
<td>16.2</td>
</tr>
<tr>
<td>Saxony/Saxony-Anhalt/Thuringia</td>
<td>8.0</td>
<td>10.1</td>
<td>14.2</td>
<td>15.7</td>
</tr>
<tr>
<td>Schleswig-Holstein/Hamburg</td>
<td>5.0</td>
<td>6.8</td>
<td>12.1</td>
<td>14.1</td>
</tr>
<tr>
<td>Northrhine-Westphalia</td>
<td>7.8</td>
<td>8.8</td>
<td>11.4</td>
<td>14.0</td>
</tr>
<tr>
<td>Rhineland-Palatinate/Saarland</td>
<td>4.4</td>
<td>6.6</td>
<td>12.8</td>
<td>13.9</td>
</tr>
<tr>
<td>Berlin/Brandenburg</td>
<td>7.5</td>
<td>10.2</td>
<td>11.3</td>
<td>13.9</td>
</tr>
<tr>
<td>Hesse</td>
<td>8.1</td>
<td>8.9</td>
<td>12.3</td>
<td>13.8</td>
</tr>
<tr>
<td>Lower Saxony / Bremen / Schleswig-Holstein / Hamburg / Mecklenburg-Western Pommerania</td>
<td>6.4</td>
<td>8.5</td>
<td>10.5</td>
<td>13.0</td>
</tr>
<tr>
<td>Lower Saxony / Bremen</td>
<td>7.6</td>
<td>10.1</td>
<td>10.8</td>
<td>12.8</td>
</tr>
<tr>
<td>Lower Saxony</td>
<td>7.6</td>
<td>10.1</td>
<td>10.5</td>
<td>12.7</td>
</tr>
</tbody>
</table>

Aggregated presentation of some states due to limited number of interviews
Basis: 39.866 / 40.072 / 39.372 / 39.672 million households in Germany
receiver is clearly higher in 2017 than it was last year: An additional 623,000 new car radios were counted while the number of in-home DAB+ receivers went up by as much as around one million sets, a comparatively identical relative increase by well over 20 per cent in each case.

Comparing these figures to the data for DAB+ receivers available to households in the year 2013, a clearly more dynamic trend for DAB+ in the car than in the home is evident. The number of sets in the home roughly trebled between 2013 and today whereas the number of in-car DAB+ recei-
vers today is six times that of five years ago. This is all the more remarkable considering the relevance of cars for radio as a genre.

Draft legislation presented by the Federal Ministry of Economic Affairs and Energy in April 2017 could lend further impetus to this development: The respective amendment to the Telecommunications Act proposes that “superior-quality radio sets may be offered only provided that they are suitable to receive digital signals corresponding to the standards in place”. It can be considered certain that car radios would come under this category, and that DAB+ will form the digital interface appears probable, to say the least. And even though the draft will not be passed during the current legislature, the Ministry has identified an important polit positioning suited to further speed up the implementation of DAB+.

Hybrid sets show strongest growth
The greatest dynamics in the range of receiver types entering German households are hybrid radio sets which are capable of receiving content both via DAB+ and via the Internet Protocol (IP). The figure in 2013 was a moderate 174,000 sets while now, just under 1.9 million are found in German homes; this is more than a ten-fold increase of hybrid radio sets over the past five years. It can be assumed that listeners appreciate the benefits of using DAB+ and the internet in a single set.

DAB+ for the first time in second place for radio reception
Looking at the listeners and at what options for radio reception they have and use, it becomes clear that in 2017 more Germans listen to the radio via DAB+ than via cable or satellite as a transmission infrastructure. In the past five years, a little less than 15 per cent of the population aged 14 years or older consumed their radio diet via cable; in 2016 and 2017, this rate shows a minor downwards trend. Satellite as the mode of reception was chosen by around 14 per cent during the same period, and this infrastructure, too, experienced a slight drop in 2016 and 2017. At the same time, the share of persons listening to radio via DAB+ increased continuously from 4.8 per cent in the year 2013 to 15.7 per cent at present, putting DAB+ in second place in the popularity league for radio reception in Germany. First place continues to be held by VHF reception which – despite a slight downward development of 1.2 per cent in 2017 – still dominates radio listening with a considerable lead: 92.9 per cent of German listeners have access to a VHF receiver and make use of it at least on occasion.

Lead of DAB+ over IP radio grows
DAB+ is not the only technology that has been gaining ground since 2013: The number of persons using an IP receiver for listening to the radio has also been steadily on the up since 2013 and has now reached 10.2 per cent of the German population. Comparing the two digital modes of reception over the five-year period, however, it is evident that DAB+ sets are gaining ground over IP receivers year by year. Five years ago, the two modes of reception had an almost identical base of listeners with DAB+ being the mode of reception for 4.8 per cent of Germans and internet radio sets being used by 4.0 per cent of the population. This minor difference of 0.8 percentage points increased in the succeeding years from 1.6 (2014) to 3.6 (2015) to 5.0 percentage points (2016) while in 2017, the gap between listeners using a DAB+ set and listeners resorting to an IP receiver has already widened to 5.5 percentage points. It will be exciting to watch whether this develop-
### Access to DAB+ in comparison by listeners

<table>
<thead>
<tr>
<th>Type of Reception</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>VHF/analogue</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital radio set DAB+</td>
<td>4.8</td>
<td>7.7</td>
<td>10.6</td>
<td>13.8</td>
<td>15.7</td>
</tr>
<tr>
<td>IP radio set</td>
<td>4.0</td>
<td>6.1</td>
<td>7.0</td>
<td>8.8</td>
<td>10.2</td>
</tr>
<tr>
<td>Cable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Satellite</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At least one type</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Persons with access to radio reception in the household; IP radio sets: installed in-car IP radios for the first time

Basis: 70.214 / 70.326 / 70.525 / 69.241 / 69.563 million persons aged 14 years or older in Germany
ment continues over the next years, generating a significant headway for DAB+ leading radio reception ahead of IP.

**VHF clearly down as the most frequently used mode of reception**

For 69.7 per cent of the radio listeners in Germany, VHF is the transmission infrastructure they use most frequently for listening to the radio. This figure demonstrates that analogue transmission is still essentially indispensable for radio as a genre at present. On the other hand, the mode of radio reception featuring the strongest use also shows the dynamic development that now characterises digital radio. Compared to last year, the number of persons mostly using VHF radio has gone down by 4.6 percentage points, with the 5-year comparison showing a drop of 8.9 points. During the same period, the rate of persons listening to the radio most frequently via DAB+ has steadily risen and has now reached 5 per cent. Five years ago, this group of "DAB+ heavy users" did basically not exist at all; a mere 0.5 per cent at the time stated that they mostly listened to the radio via DAB+. Today 12.7 per cent of radio listeners in Germany most frequently switch on a DAB+ set or an IP receiver for listening to the radio while VHF for this group has already turned into a secondary mode of reception.

The small fan group favouring cable reception appears to be completely unimpressed by the revolution set in motion by the digitisation of transmission infrastructures. Cable is the most frequently used mode of reception for 2.7 per cent of radio listeners, and a change of this share has not been evident over the last five years. Listeners

---

**Fig. 4:**

**Type of radio reception most frequently used**

<table>
<thead>
<tr>
<th>Year</th>
<th>VHF/analogue</th>
<th>DAB+</th>
<th>Internet radio</th>
<th>Radio via cable</th>
<th>Radio via satellite</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>69.7</td>
<td>5.0</td>
<td>7.7</td>
<td>1.5</td>
<td>8.5</td>
</tr>
<tr>
<td>2016</td>
<td>74.3</td>
<td>3.4</td>
<td>5.9</td>
<td>1.2</td>
<td>8.6</td>
</tr>
<tr>
<td>2015</td>
<td>73.9</td>
<td>1.8</td>
<td>5.6</td>
<td>1.8</td>
<td>8.9</td>
</tr>
<tr>
<td>2014</td>
<td>75.1</td>
<td>1.1</td>
<td>5.3</td>
<td>2.6</td>
<td>9.0</td>
</tr>
<tr>
<td>2013</td>
<td>78.6</td>
<td>0.5</td>
<td>5.2</td>
<td>2.7</td>
<td>6.2</td>
</tr>
</tbody>
</table>

0% 25% 50% 75% 100%

- VHF/analogue
- DAB+
- Internet radio
- Radio via cable
- Radio via satellite
- No type of reception most frequently used
- (Do not use) any type of reception

Basis: 70.214 / 70.326 / 70.525 / 69.241 / 69.563 million persons aged 14 years or older in Germany
who use an analogue cable receiver for their radio consumption will, however, have to face up to the switchoff of the analogue cable signals which is scheduled for 2018, and this change might well provide a further push for DAB+ radio reception.

**Analogue cable switchoff: VHF transmission route benefits most**

In Germany, a total 6.4 million persons aged 14 years or older own at least one radio set allowing for analogue cable reception. The survey conducted for the report on digitisation in 2017 also analysed how these persons would act, should the analogue radio signal be discontinued. Of those questioned, 27.8 per cent stated that they would switch from analogue to digital cable reception, and thus stay with linear radio transmission. For the event of a switchoff of analogue cable radio, 24.1 per cent would resort to VHF listening while 13.9 per cent were still undecided at the time of the survey as to what they would do. 11.9 per cent stated that they would not substitute their analogue cable radio at all. Of persons having at least one radio set allowing for analogue cable reception at their disposal, 7.8 per cent plan to switch to an IP receiver while another 6.1 per cent would also opt for internet radio, but would listen to the

![Analogue cable switchoff](image)

Basis: 6.447 million persons aged 14 years or older in Germany owning at least 1 radio set for analogue cable reception
content via a laptop, PC or similar devices. Changing to a DAB+ receiver would be the preferred choice for 5.9 per cent of listeners affected by the switchoff of analogue cable transmission.

The findings concerning the planned reaction to the switchoff of analogue cable show that internet radio is consumed by means of a large number of different end devices. Only a fraction of internet radio consumption overall is attributable to specific IP radio sets; internet radio is furthermore consumed via PCs, laptops, smartphones and a great number of other end devices featuring an internet connection. 33.5 per cent of persons aged 14 years or older in Germany listen to the radio via the internet at least occasionally, independently of the end device they use, and only 13 per cent of this group resort to an IP radio receiver for this purpose. This means that overall, internet radio enjoys more consumption than radio consumption via DAB+ despite the fact that the penetration of IP radio sets is lower than that of DAB+ receivers. Another figure to confirm this finding is the fact that internet radio is the form of radio consumption most frequently used by 7.7 per cent of the German population while the figure for DAB+ consumption is only 5.0 per cent.

Conclusion
The consumer electronics industry nowadays backs DAB+ to a greater degree than was the case some years ago. Hybrid receivers are certain to be found in the shops at affordable prices. And despite the fact that the automotive industry still largely declines fitting their cars with DAB+ receivers as a standard and reserves the right to install digital receivers in new cars only as an extra to be charged, the number of in-car DAB+ receivers is going up particularly strongly as described. At the same time, additional new channels coming on air via DAB+ provide further incentives for purchasing a DAB+ set. With the start of the second national multiplex, as many as 18 new commercial channels should promote growth. Supply with DAB+ content needs to be optimised while the technical reach should be further increased. In this respect, the transmission of commercial channels via capacities available in the DAB+ networks of the public-service broadcasters offer considerable potential. In Bavaria, a cooperation to this effect taken out between the public-service broadcaster, BR, and the commercial broadcasters has already started in part, and in Hesse, a similar scheme might follow soon. As a result, the range of content available to consumers will go up while the distribution costs for the content providers will go down.

The economic viability of DAB+ radio services presently still trails the general development of the digital technology. To date it does not yet reflect the significance which digital radio has already reached for listeners, the content landscape and the future of the radio sector overall. This requires a continuous analysis of the audience reach of DAB+ services in line with the established currencies of market research. This could turn DAB+ radio into attractive advertising outlets, enabling the content providers to market their services. The research conducted for Bavaria (Funkanalyse Bayern, FAB) in 2017 proved that some DAB+ services already score audience reaches that are attractive for the advertising industry. Establishing the reach of DAB+ services as announced by the association of media analysts (agma) for 2018 thus presents the next milestone on the development route for DAB+ and the digitisation of radio.
Methodology

This study was conducted by Kantar TNS Media Research on behalf of the German media authorities. As in the preceding years, it employed computer-assisted telephone interviews (CATI). For better accommodating the increased percentage of persons exclusively or mostly available via mobile phones, the survey was conducted via so-called dual-frame telephone interviews, i.e. as a combination of fixed-line telephones and mobile phones (80 versus 20 per cent). The selection was based on the telephone random sampling system for fixed-line phones and mobile phones used by the association of German market research institutes (“Arbeitsgemeinschaft der deutschen Marktforschungsinstitute”, ADM). Both sampling frames were subsequently merged by use of design weighting to provide for a representative picture of the overall population basis. The interviews were conducted during the period 02 May – 21 June 2017.

The overall population basis for the survey was presented by the population in German-language households aged 14 years or older. This corresponds to the definition used by Media-Analyse (ma) (= German households with an EU 28 head of household plus households with a non-EU head of household with completed school education).

The overall population basis for this year comprises 39.672 million households. Of these, 96.6 per cent own at least one TV set. The results concerning TV reception are based on these 38.307 million TV households.

The 2017 survey is based on a net number of well over 8.200 interviews. Until 2012, the person in a household with whom the interview was conducted was the person stating that they knew best about TV consumption. As has been the case for the last four years already, the person to be interviewed in the course of the 2016 survey was selected at random in order to obtain information on personal media consumption as well. The overall basis relating to persons interviewed was 69.563 million persons aged 14 years or older.

Similar to previous years, the interviews were conducted disproportionately to warrant a sufficiently solid minimum basis for each German state (“Land”). At least 200 interviews were carried out in each state. For separately showing the results of the states with a smaller population, the number of interviews conducted in these states was increased to 500 cases, in some cases even by as much as 500 cases, at the request of some media authorities. The disproportionality was subsequently balanced during weighting in order to obtain representative results on a “total” basis for all persons/households respectively.

Definition of cable and satellite reception

As this survey focuses on the perspective of TV reception in households, television sets connected to a satellite master antenna system (SMATV) which do not require a separate receiver for TV reception are counted as cable reception. Satellite reception therefore only comprises television sets using a satellite receiver.

Establishing transmission platforms and transmission technologies

For the first television set in the home, all available transmission platforms were analysed. Where necessary, an aggregated survey was conducted for further sets available in a household as last year. Regarding households receiving both terrestrial and satellite services using the first, second or further sets, both transmission
categories were included in the data for transmission modes available in TV households. In some constellations, this can result in a sum total exceeding 100 per cent (Fig. 2).

In the analysis of the transmission technologies (analogue or digital) cable reception forms an exception: Television households with cable reception using a TV set which is connected to a digital cable receiver can continue watching analogue services. For the benefit of uniform presentation of all modes of transmission, all cable TV sets with a digital receiver are counted as digital units.
Daten & Fakten zur internationalen Digitalisierung
While analogue television reception is close to being fully replaced by the digital technology, the transition from SD to HD in Europe is accelerating. HDTV is becoming a true factor for speeding up the digitalisation process as end users are looking for a better picture quality, and at the same time, for more flexibility in terms of video consumption: TVs are becoming smart and connected, linear and non-linear video consumption happens now on both TV set and further devices.

All these trends on the European television market in 2016 are underlined by the data collected in the annual Satellite Monitor survey conducted by SES which monitors the progress of TV reception within the footprint of the European SES satellite fleet.

Status of digitalisation in Europe
At the end of 2016, digitalisation of European TV households had increased from 89 per cent (2015) to 91 per cent at present. Expressed in the number of households in Europe, 230 of the 253 million TV homes now have digital TV reception resorting to one of the four modes of reception (satellite, cable, DTT, IPTV and/or DSL-TV). Compared to the end of 2015, this represents an increase of 2.2 million households.

High-definition TV (HDTV) once again proved to be the driver of digitalisation. HDTV has been continually advanced, thus offering one of the key benefits of digital television reception: close to 9 million new HD households push the number of digital homes up to 135 million now, corresponding to 53 per cent of all TV households. This includes 51 million satellite homes placing satellite at the top spot of the audience reach of HDTV platforms. The share of HDTV households among satellite homes has now reached 58 per cent. A further 31 million households receive their HDTV channels via digital cable, 27 million via DTT and 26 million via IPTV.

Progress of transmission routes
In the course of this development, the share of digital households related to the various transmission routes did not see any major changes: The market share of 38 per cent puts satellite at the top of the digital reception league with 88 million households, followed by DTT at 59 million households (corresponding to a market share of
European TV market close to full digitalisation

26 per cent) and digital cable attracting 48 million households (21 per cent of the total) while IPTV brings up the rear with 35 million (15 per cent).

Having won 3.9 million households within one year, however, IPTV is the fastest-growing route of transmission. France which is home to more than one third of the IPTV households in Europe (12 million) not only holds pride of place as the most advanced IPTV market in Europe, but also ranks third in the world, topped only by China and the U.S.

The remaining 23 million analogue television households in Europe are supplied via cable or traditional terrestrial transmission. The majority (17 million) of analogue homes receives its television via cable. 26 per cent of the cable homes across Europe still await digitalisation. Regar-

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**Fig. 1:**

**European HDTV homes per infrastructure (in million homes)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Satellite</th>
<th>Cable</th>
<th>Terrestrial</th>
<th>IPTV</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>35</td>
<td>18</td>
<td>15</td>
<td>8</td>
</tr>
<tr>
<td>2013</td>
<td>38</td>
<td>21</td>
<td>15</td>
<td>12</td>
</tr>
<tr>
<td>2014</td>
<td>47</td>
<td>26</td>
<td>29</td>
<td>16</td>
</tr>
<tr>
<td>2015</td>
<td>50</td>
<td>29</td>
<td>29</td>
<td>19</td>
</tr>
<tr>
<td>2016</td>
<td>51</td>
<td>31</td>
<td>27</td>
<td>20</td>
</tr>
</tbody>
</table>

Source: SES Satellite Monitor, year end 2016

**Fig. 2:**

**Modes of digital TV reception in Europe**

- IPTV: 35 mill. (15%)
- Satellite: 88 mill. (38%)
- Cable: 48 mill. (21%)
- Terrestrial: 59 mill. (26%)

Digital TV Homes: 230 million

Source: SES Satellite Monitor, year end 2016

**Fig. 3:**

**Modes of TV reception among analogue TV homes in Europe**

- Analogue TV Homes: 23 million
- Terrestrial: 6 mill. (25%)
- Cable: 17 mill. (75%)

Source: SES Satellite Monitor, year end 2016
European TV market close to full digitalisation

Ding terrestrial supply, 91 per cent of homes now receive digital television providing an extended range of channels.

Comparison by regions

As could already be noted over the last years, there is still a clear West-East divide. In Western Europe, 96 per cent of TV households have already gone digital whereas in Eastern Europe, digitalisation has only reached 73 per cent to date. The regional discrepancy is also evident when comparing the status of cable homes: 86 per cent of cable households in Western Europe are digital versus 52 per cent in Eastern Europe. The difference is even more marked for terrestrial reception: while in Western Europe almost all terrestrial TV homes use DTT (99 per cent), the rate in Eastern Europe is 63 per cent.

In seven West European countries digitalisation has reached or is nearing completion: the United Kingdom, Italy, Ireland, Finland, France, Spain and Norway. A further twelve countries rank above the European digitalisation average of 91 per cent and are thus well en route to full digitalisation while 14 countries surveyed rank below the average level of digitalisation. This is the case mainly for markets in Eastern Europe where both the cable networks and the terrestrial infrastructure are lagging behind.

The difference between Western and Eastern Europe can also be noted when analysing HDTV: 111 of 135 million HD homes are located in Western Europe, corresponding to 63 per cent of all TV households in the respective regions; the 21 million HD homes in Eastern Europe correspond to a regional share of 33 per cent. A similar picture emerges when looking at satellite reception: 38 million satellite HD households in Western Europe (72 per cent of satellite homes overall) compare with 9 million satellite HD households (or 50 per cent) in Eastern Europe.

Status of digitalisation in Germany

The German market is characterised by great stability of the reception routes. After the exceptional year 2012 which featured the switch-off of the analogue satellite signal with a resulting great leap in digitalisation, there has been hardly any change regarding the rate of digitalisation last year at a slight increase from 90 to 94 per cent putting Germany on par with the European average.

All transmission routes are fully digitalised except cable, still supplying 2.4 million or 14 per cent of cable homes with analogue television.

Similar to the comparison across Europe overall, the shares held within the digital market showed hardly any changes over last year: Digital cable is the mode of supply for 40 per cent of digital television households, DTT is available in 5 per cent and IPTV is used by 6 per cent of German homes while satellite reception in Germany at 49 per cent presents the most popular route of transmission for digital television.

HDTV development is also on a stable course in Germany. Between the end of 2015 and the end of 2016, 2.6 million television households in Germany upgraded their equipment to allow for HDTV reception, thereby reaching 22.5 million HD homes.

This corresponds to a HD share of 59 per cent of all German television households, which is below the average in Western Europe (63 per cent).

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1 To allow for a comparison with the data available for the other countries in Europe, the figures are based on the data of the SES Satellite Monitor (Year end 2016); this explains the difference to the data contained in the Facts and Figures section of this report. Further information on the differences can be found in the „Methodology“ section.
European TV market close to full digitalisation

Satellite continues to dominate HDTV reception at 11 million HD homes corresponding to a market share of 50 per cent. Cable follows in second place with 9 million and an HD market share of 42 per cent. IPTV has moved up to close to 2 million and takes 8 per cent of the HD market while, at Year End 2016, DTT was not yet supplying any HD content.

In Germany, 65 per cent of satellite homes receive content in HD quality, while the European average is 58 per cent.

**Ultra HD is emerging**
Consumers are looking for better picture quality and, while the transition from SD to HD is accelerating, Ultra HD is emerging both in terms of TV sets and TV channels.

At year end 2016, close to 70 TV channels are broadcast in Ultra HD worldwide. Almost half of them are hosted on SES satellites serving mainly the European and North American markets.

57 per cent of the German TV homes have already heard about Ultra HD (compared to 48 per cent at year end 2015). This is well above the European average of 34 per cent.

Only 6 per cent own already an Ultra HD TV screen, this is very comparable to the European average of 7 per cent.

The number of Ultra HD screens in Europe has gradually increased over the past years, tripling from 6 million in 2014 to over 17 million in 2016. As of the end of 2016, 7 per cent of European homes are already equipped with an Ultra HD screen.

Satellite leads the way among the UHD-ready homes (homes owning an Ultra HD screen). Almost half of the Ultra HD-ready homes (46 per cent) in Europe are satellite homes.
European TV market close to full digitalisation

### Abb. 7:

**Percentage of HDTV among all satellite homes (per country):**

<table>
<thead>
<tr>
<th>Country</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>United Kingdom</td>
<td>85%</td>
</tr>
<tr>
<td>Poland</td>
<td>81%</td>
</tr>
<tr>
<td>Austria</td>
<td>80%</td>
</tr>
<tr>
<td>Slowak Republic</td>
<td>79%</td>
</tr>
<tr>
<td>Norway</td>
<td>79%</td>
</tr>
<tr>
<td>France</td>
<td>79%</td>
</tr>
<tr>
<td>Sweden</td>
<td>78%</td>
</tr>
<tr>
<td>Netherlands</td>
<td>78%</td>
</tr>
<tr>
<td>Denmark</td>
<td>77%</td>
</tr>
<tr>
<td>Greece</td>
<td>77%</td>
</tr>
<tr>
<td>Belgium</td>
<td>74%</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>70%</td>
</tr>
<tr>
<td>Finland</td>
<td>70%</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>70%</td>
</tr>
<tr>
<td>Italy</td>
<td>66%</td>
</tr>
<tr>
<td>Ireland</td>
<td>66%</td>
</tr>
<tr>
<td>Spain</td>
<td>65%</td>
</tr>
<tr>
<td>Germany</td>
<td>65%</td>
</tr>
<tr>
<td>Lithuania</td>
<td>62%</td>
</tr>
<tr>
<td>Slovenia</td>
<td>60%</td>
</tr>
<tr>
<td>Estonia</td>
<td>57%</td>
</tr>
<tr>
<td>Croatia</td>
<td>55%</td>
</tr>
<tr>
<td>Hungary</td>
<td>54%</td>
</tr>
<tr>
<td>Switzerland</td>
<td>53%</td>
</tr>
<tr>
<td>Portugal</td>
<td>50%</td>
</tr>
<tr>
<td>Bosnia</td>
<td>45%</td>
</tr>
<tr>
<td>Latvia</td>
<td>41%</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>41%</td>
</tr>
<tr>
<td>Algeria</td>
<td>39%</td>
</tr>
<tr>
<td>Serbia</td>
<td>37%</td>
</tr>
<tr>
<td>Georgia</td>
<td>31%</td>
</tr>
<tr>
<td>Belarus</td>
<td>31%</td>
</tr>
<tr>
<td>Tunisia</td>
<td>26%</td>
</tr>
<tr>
<td>Romania</td>
<td>26%</td>
</tr>
<tr>
<td>Ukraine</td>
<td>17%</td>
</tr>
<tr>
<td>Morocco</td>
<td>9%</td>
</tr>
<tr>
<td>Moldova</td>
<td>6%</td>
</tr>
</tbody>
</table>

Source: SES Satellite Monitor, year end 2016
European TV market close to full digitalisation

Fig. 8:
Per centage of UHD ready homes by mode of reception

- Satellite: 46%
- Cable: 18%
- Terrestrial: 17%
- IPTV: 19%

Ultra HD ready homes: 17 million

Source: SES Satellite Monitor, year end 2016

Fig. 7:
TV homes equipped with Ultra HD/4K screens in Europe (in million)

- 2014: 6 million (2%)
- 2015: 12 million (5%)
- 2016: 17 million (7%)

Source: SES Satellite Monitor, year end 2016

Fig. 9:
Number of Homes & TV Homes and TV penetration rate (in %) in Europe

- 2012: 97.6%
- 2013: 97.6%
- 2014: 97.4%
- 2015: 97.1%
- 2016: 96.8%

Source: SES Satellite Monitor, year end 2016
European TV market close to full digitalisation

The rise of OTT in Europe
Consumers watch high quality TV on their large screens while they use complementary offers, including on-demand services, on other platforms and alternative screens.

OTT offers a great variety of video content. End users can either watch live web TV on any device, such as TV programmes at the same time as they are broadcast on the “traditional” television set.

They can also watch programmes over the internet on demand, derived from the broadcasters’ media libraries, from VOD providers such as Netflix or Amazon, from video-sharing websites such as YouTube or through social networks, just to name a few examples.

Despite the emergence of OTT services such as Netflix and Amazon in the past years, the proportion of TV homes over the total number of homes in Europe has remained at similar levels.

At year end 2016, for the first time, SES Satellite Monitors research included the OTT topic. 19 countries were surveyed at YE16 regarding OTT representing a sample of 171 million homes.

Out of them, 52 per cent claimed that they consume OTT on any device.

OTT consumption is well-established on a variety of devices, but non-TV devices are by far the most popular (63 per cent), 26 per cent use both TV sets and non-TV devices, and a mere 11 per cent of homes use only the TV for this. This highlights the complementarity of OTT to classic linear TV.

In almost two-third of the cases OTT is consumed on non-TV devices and in another quarter TV sets and non-TV devices are used interchangeably.

Homes viewing OTT consume non-linear video content to a larger extent (88 per cent) than linear programmes (67 per cent).

The trend that we see here is a diversification of the video offer: people want to use different screens and different forms of consumption at the same time.

When it comes to paying for OTT services or to using them for free, consumers prefer for a large majority (73 per cent) enjoying the OTT services available for free only. A quarter pay for certain services in addition.

Fig. 10: Homes that consume OTT on any device

Fig. 11: Devices used for OTT consumption

Source: SES Satellite Monitor, year end 2016

Source: SES Satellite Monitor, year end 2016
European TV market close to full digitalisation

The question is not whether they will switch to a digital television infrastructure, but only when this will happen. HDTV will continue to act as the main driver for digitalisation over the coming years. In the more advanced markets meanwhile the next stage of the evolution is already waiting on the doorstep: Ultra HD or 4K will allow for an incredible television experience at four times the resolution of HDTV, and will ensure that the future of television will be anything but boring. The first transmissions of the new Ultra HD television have already been successfully completed via SES satellites. While picture quality matters more and more for the end consumers, they are also enjoying a wider offer in terms of video content from the internet on a variety of devices (smart TV, mobile devices, etc...). The complementarity of OTT to classic linear TV allows an even greater diversification of the video offer: consumers can now use different screens and different forms of consumption at the same time.

**Fig. 12:**

**Type of video content (pay versus free only) used by European homes**

- Free video content only: 73%
- Pay video content: 25%
- Homes viewing OTT: 89 million
- No answer: 2%

Source: SES Satellite Monitor, year end 2016

**Conclusion and outlook**

Full digitalisation of the television markets in Europe is not anymore questionable and will happen rather sooner than later. In 2016, many countries again took major steps forward towards full digitalisation, have almost reached or already completed it. For the remaining analogue homes
The remit of the media authorities regulating platforms

Platform regulation as laid down in German broadcasting law aims at securing equal access to networks and platforms and at ensuring that the broadcasting offers can be found by viewers. The infrastructures of the networks and the user surfaces are to be found in a central position between the broadcasters and the viewers, and can potentially impact access to the audience for the broadcasters and thus ultimately affect the free formation of opinion. This scenario necessitates an independent institution regulating this sector.

Ensuring findability on user surfaces
User surfaces, electronic programme guides (EPG in short), navigators or listings show the content available, allowing direct access to content for a viewer. The media authorities ensure equal opportunities and non-discrimination for all broadcasting content to be found via these surfaces. This comprises, among other things, that differing providers offering the same category of content are listed in a comparable fashion. The criteria adopted by platform providers for listing content are published on the website of the media authorities to help making this transparent.

The empirical survey conducted in the framework of the report on digitisation proves that pre-set listings still have considerable importance. At the same time, the relevance of app portals provided on smart TV sets is enjoying a noticeable increase.

Regulation at present applies only to the user surfaces provided by platform operators. For this reason, the media authorities advocate an extension of regulation to cover all user surfaces including, among others, smart TV sets, home screens or set-top boxes which present an overview of all broadcast services available and allow individual services to be accessed directly.

Ensuring equal access to platforms
With the scarcity of transmission capacities having come to its end, the must-carry provisions have somewhat shifted out of focus. In turn, the economic terms applying to content distribution are gaining considerable relevance as the significance of HDTV increases and the platform operators now market HD content. The structure of the payment schemes must pass the criterion of plurality of opinions. The media authorities...
verify whether comparable offers are distributed at comparable terms on the basis of the contractual agreements reached between broadcasters and platform operators.

Alongside the traditional routes of transmission, OTT platforms are becoming more and more important, permitting audiences to access broadcast offers and comparable video content; this is shown in the facts and figures section of the report on digitisation. In this context the media authorities also pay attention to the developments in politics and media legislation as regards net neutrality. Here, too, plurality commands that individual offers are not granted preferential treatment.

Transparency and cooperation
For the media authorities, transparency in the broadcasting sector constitutes a key objective. To this end, they regularly go public organising events and issue publications including this report on digitisation; they offer information and conduct debates on topical issues. Platform regulation is handled in the Commission on Licensing and Supervision (ZAK) of the media authorities. Alongside this cooperation of the media authorities among themselves, the regulators also exchange views and positions with the Federal Network Agency and the Federal Cartel Office. Regarding the introduction of DTT2 HD, for instance, the issue of cooperation among market players was discussed with the Federal Cartel Office while the necessary capacity requirements were developed jointly with the Federal Network Agency and the German states. This well-established cooperation should now be underpinned by a stronger legal provision, thus attributing the appropriate relevance to securing pluralism in the process.

Accompanying the process of transformation – the media authorities as moderators
The progress of technology results in changes of the broadcast transmission infrastructures at irregular intervals. The media authorities have been accompanying these processes of transformation for several years already. They are involved in the switchover to the new terrestrial television standard DTT2 HD procedure which will continue until 2019 in some areas; in this process the media authorities moderated a Round Table of the major television groups and the association of commercial broadcasters (VPRT) to ensure a joint approach. The communication policy in particular necessitated a thorough exchange of views and positions in advance of informing the general public and the experts.

In the context of the impending switch-off of analogue cable transmission the media authorities initially conducted several meetings with the industry seeking to develop a joint line from the differing positions of content providers, network operators and the housing industry. The Round Table on the switchover of cable from analogue to digital transmission now provides a platform for all players involved to determine the concrete conditions for the switchover. The data in this report on digitisation outline the aspects that need to be taken into consideration for a consumer-friendly switchover.
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From 1998–2000 she studied International Business at Caen University (France) and Coventry Business school (UK) where she completed her studies with an MBA. From 2001 until mid-2006 Laurence Cribier worked as Sales Support at Copeland Germany in Frankfurt am Main.

Laurence joined SES S.A. in Betzdorf (Luxembourg) mid-2006 as Sales Planning Analyst. In 2012, she moved to the Marketing department and took over the position of Senior Market Research Coordinator, supporting the Market Research projects globally and leading the Satellite Monitor, a survey conducted among private homes to find out about the development of TV reception in more than 35 countries.

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During the summer of 2012 he was a visiting researcher in NASA Goddard Space Flight Center. He then worked as a strategic planning and market analysis consultant for Euroconsult from 2012 to 2015.

Ricardo joined SES S.A. in Betzdorf (Luxembourg) in 2015 as a Senior Business and Market Analyst within the Marketing department, to support the Market Research projects globally. Since then he has become a key contributor to the Satellite Monitors project, a survey conducted among private homes to find out about the development of TV reception in more than 35 countries.
**Glossary**

**analogising**
The process of analogising involves a digital signal transmitted via satellite or terrestrially being converted into an analogue television signal for feeding into a cable network, enabling cable customers to continue using an existing analogue TV receiver. The conversion from digital to analogue signal, however, always results in reduced image quality.

**app (application)**
Apps are applications that can be activated on the screen by triggering the respective field, sign or icon.

**broadband**
The term broadband is linked to technical aspects, while the bitrate providing the starting point for broadband is determined under political considerations on the national and European levels. Initially, all bitrates above 256 kbit/s were considered broadband; this rate has long since been increased to 2 Mbit/s (download rate) with further redefinitions of the rate to be expected soon. The higher the rate for broadband available, the more data can be transmitted per second.

**DAB+ (Digital Audio Broadcasting)**
DAB symbolises the digital transmission of audio-signals through the air. The “+” symbol signals the extension of the standard for improved sound quality which also allows the transmission of programme-related additional information.

**DVB-C (Digital Video Broadcasting — Cable)**
European standard for digital cable television. DVB sums up the transmission of digital television signals distributed via satellite (DVC-S), via cable (CVB-C) or terrestrially (DVB-T or DTT). Better quality and the possibility to transmit additional services are complemented by a more efficient use of the capacities available.

**DVB-T (Digital Video Broadcasting — Terrestrial)**
or DTT (digital terrestrial television) is the European standard for digital terrestrial television which can be received using a settop box or a TV set (which might also be a technically suitable PC) featuring an integrated DVB receiver (tuner).

**DVB-T2 HD (also DTT2 HD)**
is the standard succeeding DVB-T in Germany. It took up regular service in March 2017. It combines the new digital terrestrial transmission standard DVB-T2 and the new HEVC compression technique, permitting the transmission of a large number of HD services.

**DSL (Digital Subscriber Line)**
Nutzung der Telefonleitung für die Übertragung hoher Bitraten; ADSL (Asymmetrical Digital Subscriber Line) Asymmetrische digitale Teilnehmer-Anschlussleitung; Datenrate im downlink: bis 6 Mbit/s; ADSL2+ bis 20 Mbit/s). VDSL (Very high bitrate Digital Subscriber Line) bis 50 Mbit/s im downlink.

**EPG (Electronic Programme Guide)**
electronic programme guide: The application which is available, inter alia, on TV sets or settop boxes, provides for an easy search and selection of digital TV offers in the form of an “electronic TV programme magazine” and in many versions also offers other functions such as programme recording or accessing recorded broadcasts, media libraries or similar features.
HbbTV (Hybrid broadcast broadband TV)
standard published by the European Telecommunications Standards Institute (ETSI) allowing the simultaneous presentation of television and internet content on the TV screen. HbbTV was devised by an industrial consortium and the Broadcast Technology Institute (IRT); it is based on a programming language version which was developed for the entertainment industry.

HDTV (High Definition Television)
high-definition television using a 16:9 aspect ratio and a minimum rate of $1280 \times 720 = 921,600$ pixels (full HD: $1920 \times 1080$ pixels).

IPTV (Internet Protocol Television)
television delivery using the internet protocol. The term does not, however, specify the network used for transmission. In general terms, IPTV is often equated with web TV which means the transmission of digital television services via the open internet. For clarification, additional details are required, e.g. IPTV via DSL.

live stream
video transmission streamed in real-time (live) in the internet. Unlike video-on-demand (VoD), live-streaming is a linear stream distributed via the open internet. Examples include sports events which cannot be shown on a traditional channel due to parallel transmission but are made available in the internet as they take place.

must-carry provisions
legal requirement for the distribution of specific broadcast content applying for platform providers and cable network operators. Article 52b of the Interstate Broadcasting Treaty regulates the digital distribution of content specified for must-carry services while analogue distribution is regulated in the state media laws; they differ from state to state.

Over-the-Top (OTT)
The term over-the-top content (OTT) covers the transmission of video and audio content via internet access points without an internet service provider being involved in the control or distribution of the content in question. Consumers can access OTT content by using receivers connected to the internet, such as personal computers, laptops, tablets, settop boxes or games consoles. Transmission necessitates sufficiently large bandwidths.

pay-TV
television services which – unlike free TV – are partly or fully encrypted for transmission. For unscrambling the services or packages, viewers must take out a subscription at cost with the respective pay TV provider.

recommendation engines
automated or editorially serviced systems recommending content to consumers of VoD offers based on their previous consumption of audiovisual content.

settop Box (STB)
receiver device for digital television. For the various transmission platforms (satellite, cable, terrestrial, DSL) different types of settop box are required.
smart TV
marketing term describing “intelligent” TV sets which alongside the standard terminal for satellite, cable or terrestrial reception are also fitted with a terminal permitting connection to the internet for TV reception and access to the internet. As a rule, access is possible to selected portals (e.g. media libraries) or programme-related information. The internet can be accessed via a wired connection (ethernet) or via WLAN (wireless local area network, also referred to as WiFi), i.e. a radio-supported local data network.

Ultra HD (UHD) or 4K
Ultra HD, also referred to as 4K, is an international standard advancing HDTV. Ultra HD offers a resolution four times that of HDTV: 2840 × 2160 pixels, providing twice as many pixels as the full HD format in height and width. The benefit of the increased pixel rate is specially noticeable for viewers using a television screen sized 55 inches (140 cm) or more in its diagonal length.

VOD (Video-on-Demand)
non-linear moving image content available in the internet for on-demand consumption via a smart TV set or other internet-ready end-devices. VOD providers operate varying business models for supplying content against payment. Subscription video-on-demand (S-VOD) involves a flat-rate as a monthly fee payable by a customer for films and series while transactional video-on-demand (T-VOD) makes content available for individual viewing once a fixed sum has been paid. Ad-supported video-on-demand (A-VOD) is advertising-funded and offers content to users free of charge.

WiFi/ IP radio receiver
stand-alone internet radio receiver accessing audio content transmitted via the internet; as a rule, reception is effected via a wireless local area network. The sets allow for access to internet-based radio offers worldwide. The audio content is usually streamed for transmission.

VHF (Very High Frequency)
range of radio frequency electromagnetic waves from 30 to 300 MHz. In Germany, local and regional radio channels are transmitted in stereo quality in the 87.5 MHz to 108.0 MHz frequency range. A good reception is possible only if transmitter and receiver are within sight of each other.
The digitisation of the cable infrastructure has taken a great step forwards and is nearing the 90 per cent mark – this is one of the findings of the research conducted on behalf of the German media authorities for the report on digitisation in 2017. At the same time, the data reveal the change of the terrestrial infrastructure which was set in motion with the start of the new DTT HD aerial television transmission. Compared to last year, the share of terrestrial television households is going down overall.

By contrast, the rate of homes receiving television content in HD quality is enjoying a major surge upwards, while consumption of moving images via live streaming and video-on-demand features similar vitality. This is described by Dr. Kristian Kunow in his article detailing the facts and figures of digitisation and the consumption of digital video in Germany. The European comparison is detailed by Laurence Cribier and Richard Topham who present television and video consumption in Europe and reveal positive trends for Ultra HD and OTT.

Digital radio reception also enjoys growing relevance: The penetration of DAB+ receivers has again gone up dramatically, and DAB+ now comes second in the popularity ranking for radio listening. This leads Adrian Gerlitsch to the conclusion that DAB+ is here to stay as he outlines in his article on the digitisation of radio. The results of the third study of DAB+ audience reach are presented in a folder enclosed in this report.

At the legislative level of the German states, a debate is currently under way with the industry on amending the Interstate Broadcasting Treaty. The legal issues which are analysed by the participants concerning privileged findability are explained by Dr. Matthias Försterling who shows in his article that reaching a compromise appears to present difficulties in some points that will necessitate decisions at the level of media policy.

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